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PC WORLD

February 1993

THE 486 PUZZLE

We Test 25 PCs With 7 Different CPUs to Find the Best Mix of Speed and Price

75 TIPS FOR BETTER WORD PROCESSING

WINDOWS FAX SOFTWARE ROUNDUP

OPERATING SYSTEM WARS: OS/2 vs. NT

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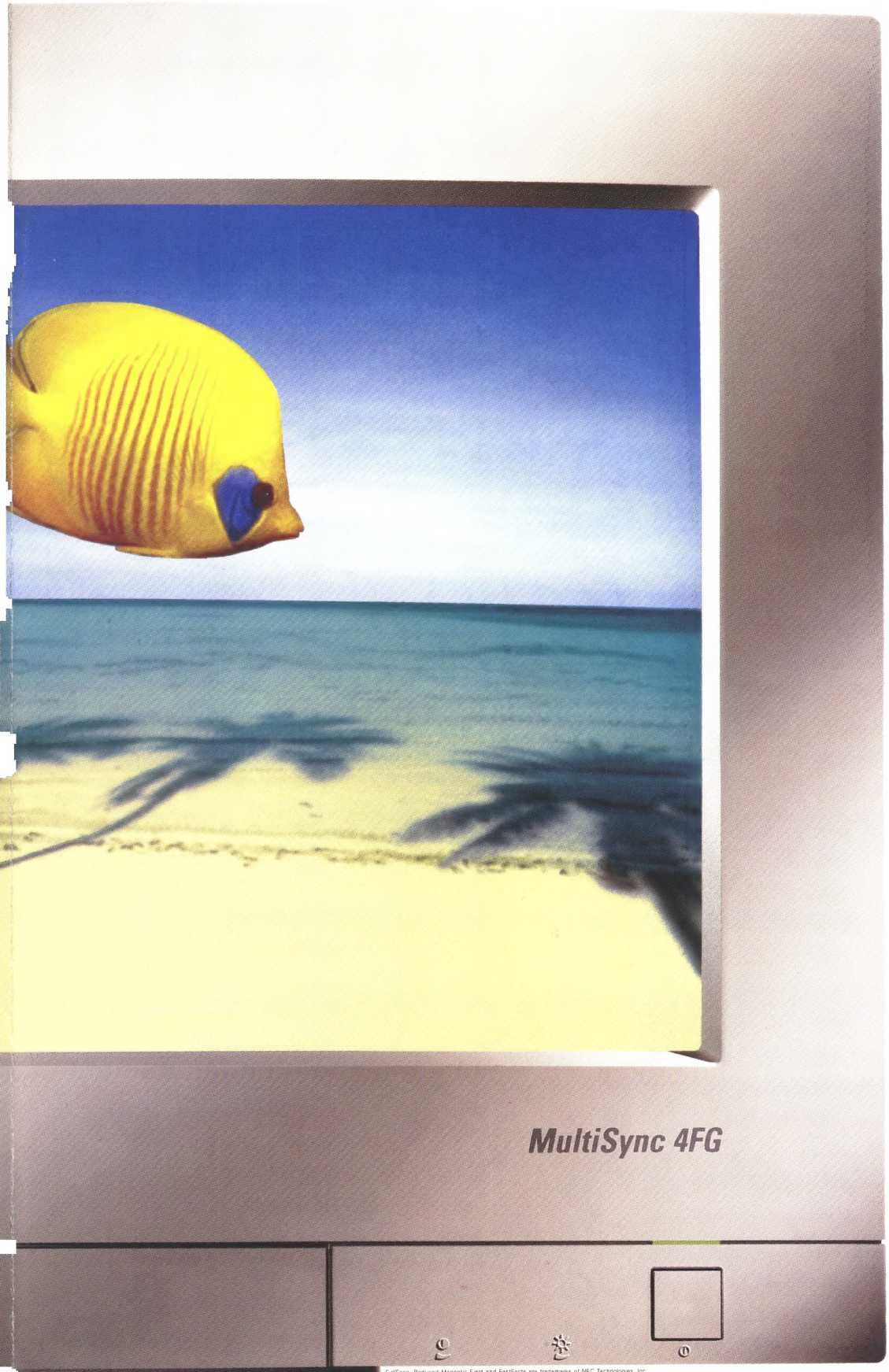

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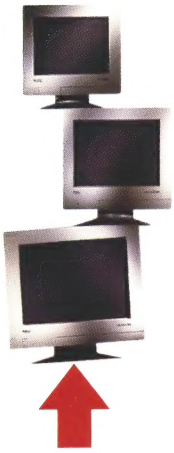

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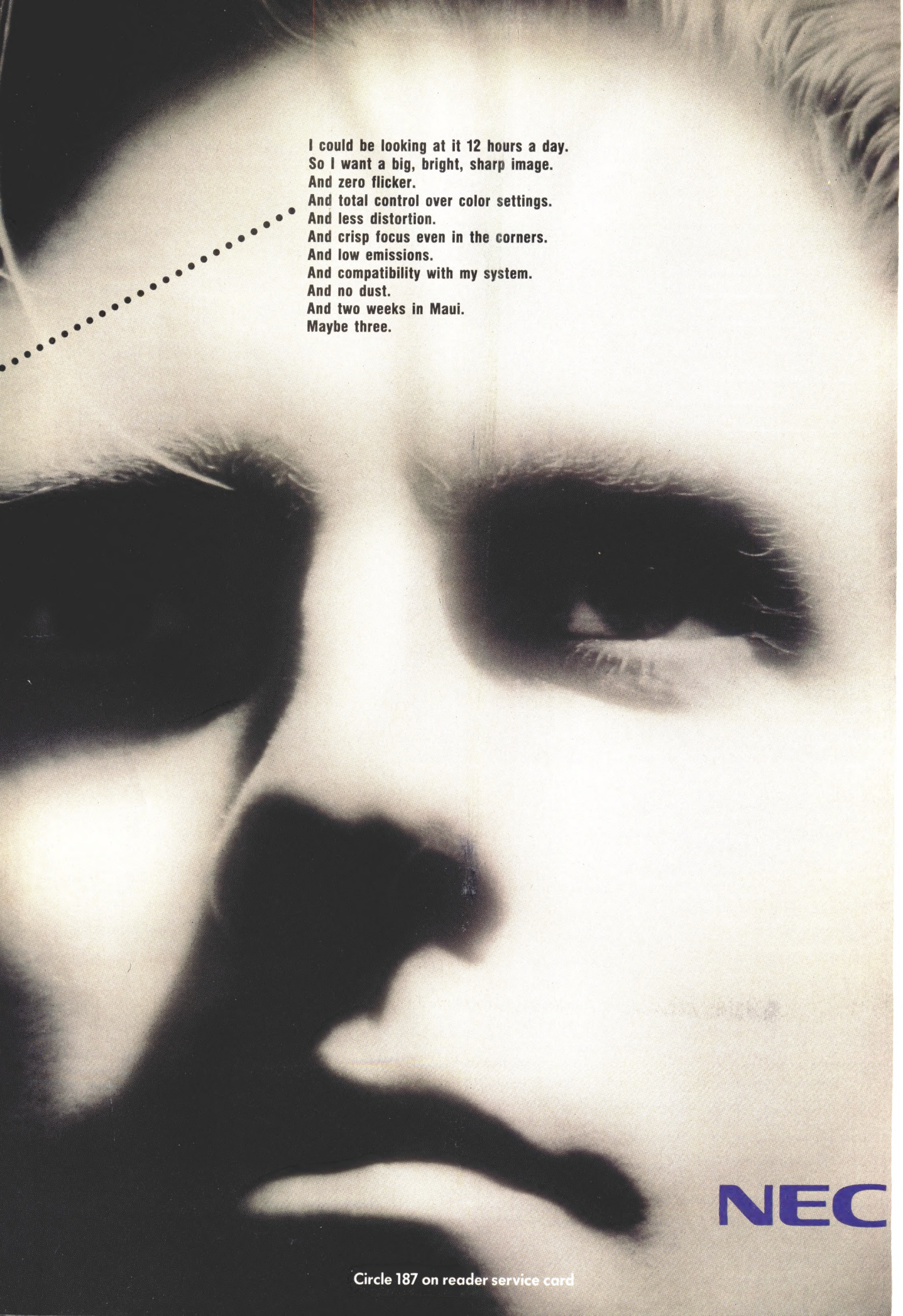
I could be looking at it 12 hours a day.
So I want a big, bright, sharp image.
And zero flicker.
And total control over color settings.
And less distortion.
And crisp focus even in the corners.
And low emissions.
And compatibility with my system.
And no dust.
And two weeks in Maui.
Maybe three.
NEC
Circle 187 on reader service card

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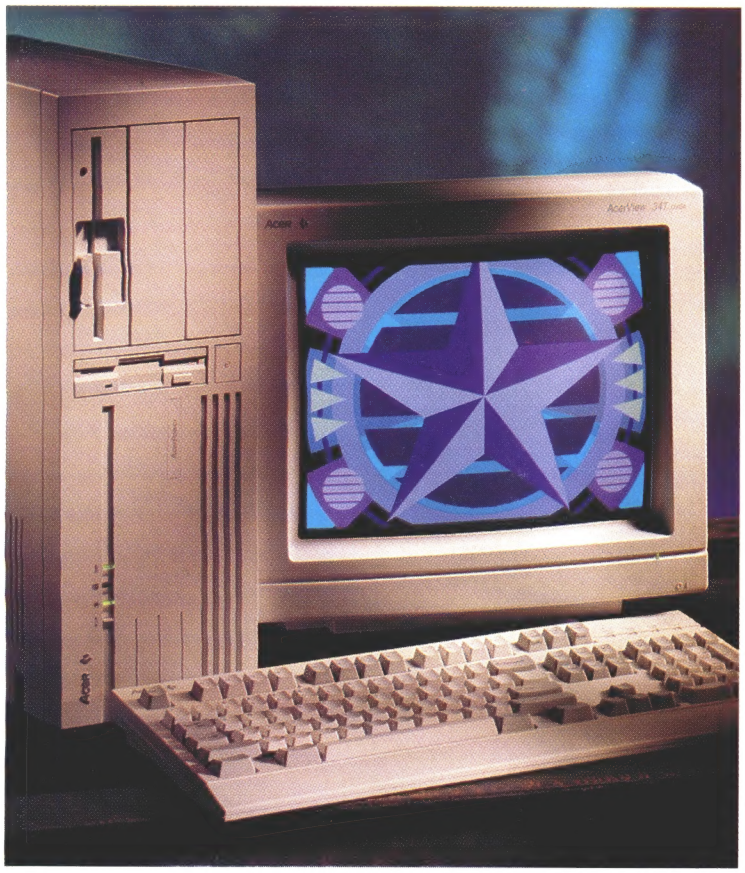

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178 75 Hot Word Processing Tips
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Cover Story

25 New 486s: The Quest for the Best PC

116 DX, SX, DX2, 50 MHz, 66 MHz, 33 MHz . . . Today's bewildering array of 486 systems can paralyze even the savviest shopper. What's the smart buy? We test 25 top 486 PCs with 7 CPUs to find the answer. The contenders:

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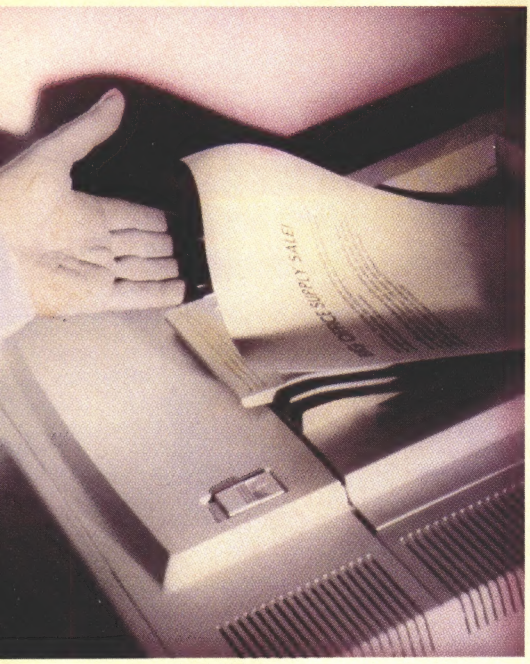
Cover photograph by Robert Cardin, digital composition by Varitel Select



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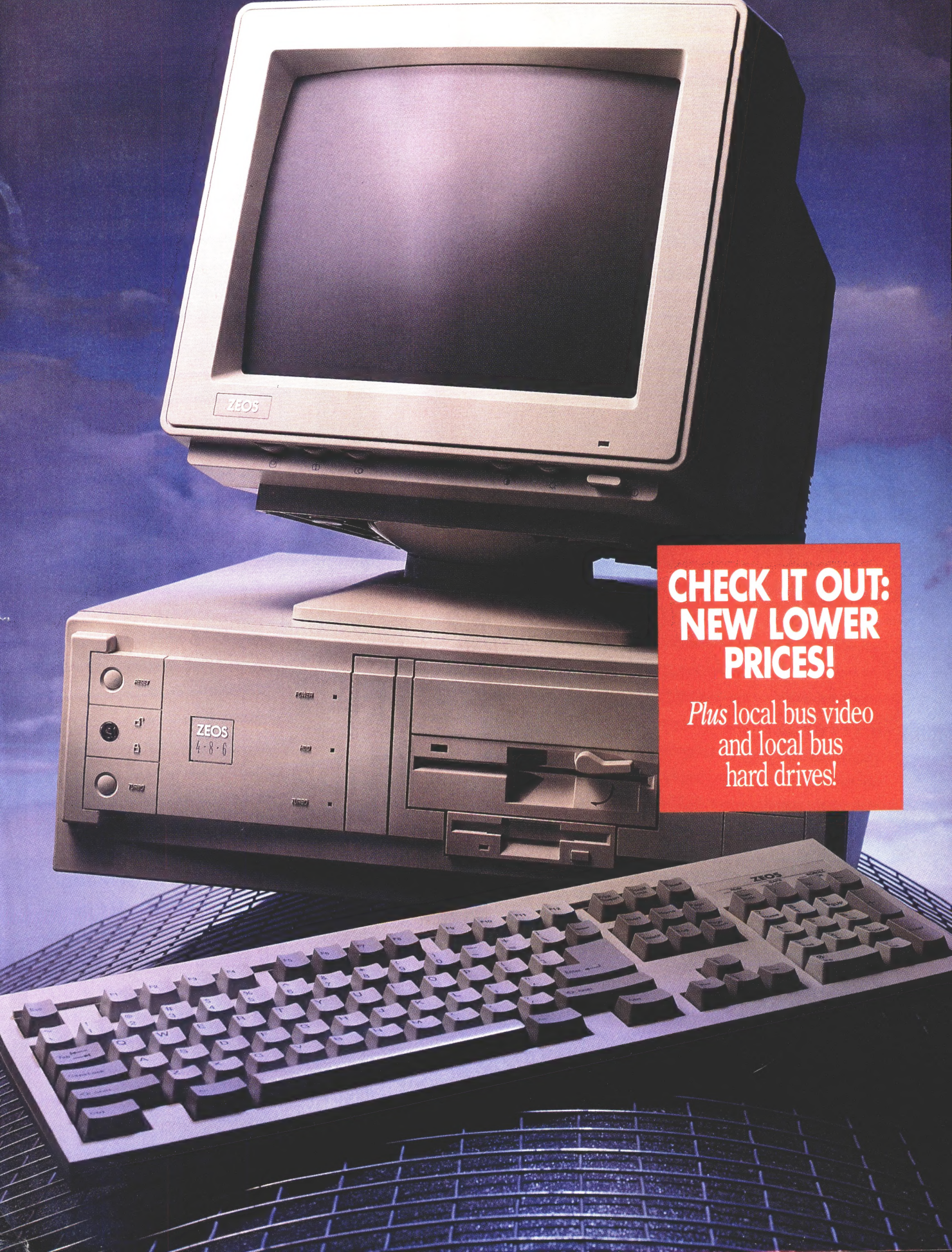
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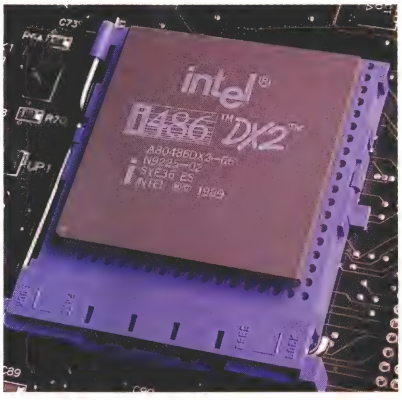
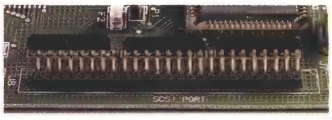


No one else gives you so much upgradability in your computer.
Notice the extra row of pins in the CPU socket? Now you can upgrade from any i486 all the way to the super OverDrive processor based on Intel's Pentium™ architecture. And the ZIF (Zero Insertion Force) socket makes it so easy!



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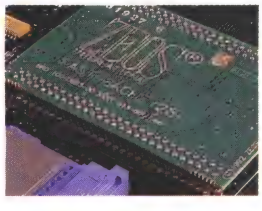

Eight expansion slots: Plenty of room to add to your system in the future.
Because we care about the long-term useability of your computer, there's room inside to expand. And with the way things change in this industry, it's a good idea to have a computer that can grow with you.

Circle 258 on reader service card

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PC MAGAZINE EDITORS' CHOICE February 11, 1992 Austin 486-33 Workstation

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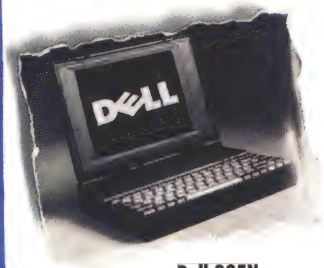

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Battery Life	4 Hours	3.5 Hours
Tech Support	24 Hours/Day	14 Hours/Day
Money-Back Guarantee	60 Days	30 Days
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Tale of a Rogue Network

In December, Editor Eric Knorr's "Complete Guide to the New CPUs" gave you background on the performance of a variety of Intel and Intel-compatible microprocessors. Our system review this month goes a step further and reviews specific, currently available PCs that are based on seven different 486 CPUs. Four of these processors come from Intel: the 486SX-25, the 486DX-33, the 486DX2-50, and the 486DX2-66. Two systems have Cyrix inside: the 486SLC-25 and the 486DLC-33. One has IBM's 486SLC2-40.

Besides providing much broader information on actual system performance running DOS and *Windows 3.1* applications, this month's review factors in major real-world considerations such as street prices and service and support. Processor performance in the abstract can be interesting, but you can't buy an abstract computer. We think the information in this review gives the best account anywhere of the real benefits that systems based on these processors can bring to your desktop today.

Do-It-Yourself Groupware

"Windows for Workgroups: Operation Rogue," the exciting tale of our first adventure with Microsoft's new *Windows for Workgroups*, speaks not only of peer-to-peer networking but also of differences in attitude about who should control what aspects of an office's computers. What makes *Windows for Workgroups* so interesting is its projected use as the mechanism through which do-it-yourself groupware can happen. *Lotus Notes* has far superior capabilities for supporting the major tasks involved in running an organization of any size. *Notes*, however, can only be adopted from above. As things stand now, you and your closest colleague can't, of your own volition, divide up a project using *Lotus Notes* on any existing Novell network. Rather, you must first convince your department or company to adopt *Notes*. By the time everyone agrees to this, you'll have completed your project using the awkward mechanism of E-mail and file import. Indeed, you and your colleague may even have moved on to other departments, companies, or careers.

The processes often required to adopt *Notes* deprive it of the benefit of pull-through demand from you and your colleague. That kind of demand has been the most powerful single engine driving the PC revolution. Microsoft's strategy is to harness that demand and let you and any co-worker grab *Windows for Workgroups* off the shelf. Just install it, get the new application releases that exploit it, and start dividing your work. When these applications ship, you'll be able, with effort, to divide and reintegrate a project by using menus and dialog boxes in the updates of the most common *Windows* applications.

Do-it-yourself groupware built on *Windows for Workgroups* gives Microsoft an excellent chance to quickly build a large installed base for groupware. Yet this groupware will lack integration, power, and adaptability to very large work groups and even whole companies—*Notes'* greatest strengths. Oh, for a cheap *Notes* Two-Pack that comes with canned run-your-office applications and coexists happily with Novell!

Some view peer-to-peer networking on an existing company client-server network as worse than a virus, for it infects the hierarchy of the organization instead of mere programs and data. While programs and data are easily backed up, let's face it—even the best disk utilities could never restore a human hierarchy. Senior Editor Steve Fox's tale of a rogue network gives an inkling of the productivity gains, political risks, administrative burdens, and good, clean fun you can have by infiltrating your organization with *Windows for Workgroups*.

MICHELE CLEMENT

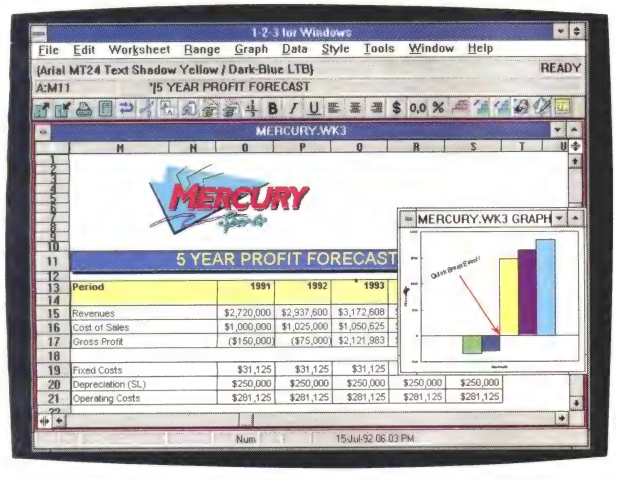
PC World Editor in Chief Phil Lemmons

If you yearn for something less controversial than heterogeneous processors and politically incorrect networks, turn to "75 Hot Word Processing Tips." These sure-fire productivity boosters will shorten your workday without getting you into hot water. Contributing Editor George Campbell has rounded up tips for the DOS and *Windows* versions of *WordPerfect* and *Microsoft Word* as well as *Ami Pro* and *WordStar*. Naturally, he used all 75 of these tips to speed up the writing of the article. He finished it in record time.

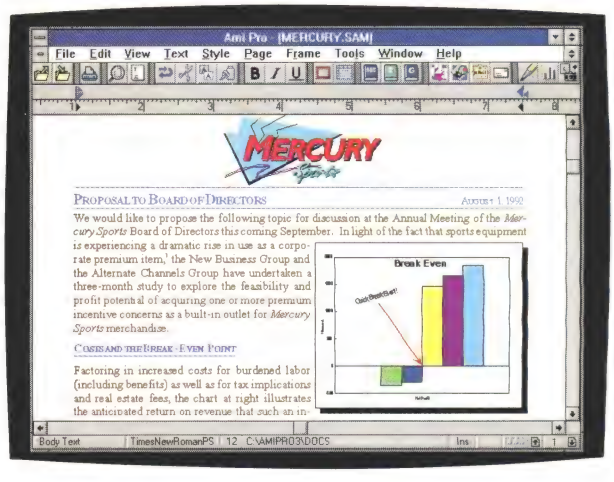
Phil Lemmons

Phil Lemmons, Editor in Chief

Compared to Lo
Microsoft Office look



1-2-3 for Windows Release 1.1 now includes over 25 new features and usability enhancements.



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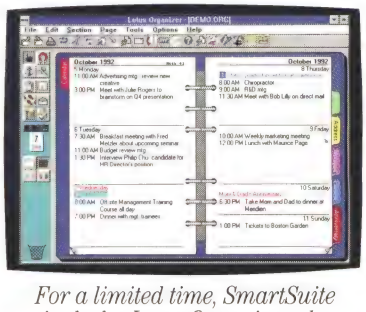

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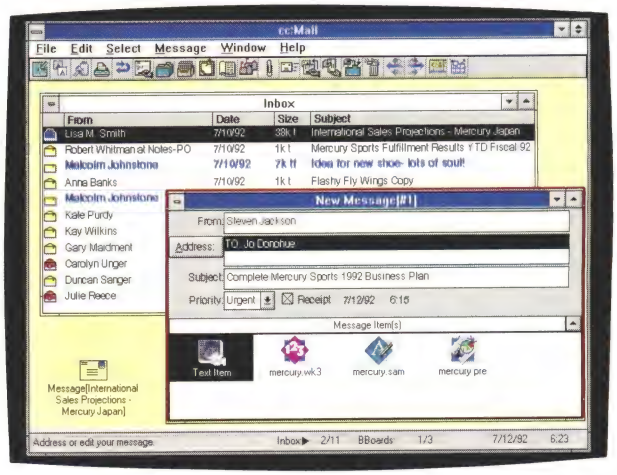

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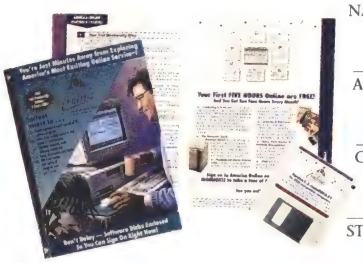

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A Skeptic Rejoins the Flock, Software Gets Its Just Desserts

Doubt No More

Terrific! Awesome! I'm describing the November issue of *PC World*. As a subscriber for several years, I was beginning to think of the magazine as a marketing arm of Intel and Microsoft. But the November issue is without a doubt the best I've seen.

"Best Choice: 486DXs or Upgraded 486SXs?" helped me make the decision to buy a new 486 machine. Thanks. It made my subscription a real bargain.

Theodore Platt, Wallingford, Connecticut

Your Data Doesn't Support Your Opinion

As sales and marketing manager for MIS Computer Systems, I'm concerned when one of our products receives less than a positive review. If constructive criticism is offered, I'll use the information to improve our product.

However, in the case of the November article "Best Choice: 486DXs or Upgraded 486SXs?" the data doesn't support the editorial opinion.

The MIS 486-50/33 ISA is midpriced, compared with the other 24 systems, even though it uses a more expensive SCSI disk subsystem and half of the other systems tested were 486SXs, which are usually less expensive.

All ten of the lower priced DX systems use a motherboard not from a leading supplier. MIS uses a Micronics board.

The Adaptec controller in the MIS system allows an additional six storage devices to be connected without the use of an expansion slot. This results in more expansion capacity than any of the other 24 systems, making the number of expansion slots a moot point. The MIS tower has nine drive bays to allow for this expansion. Three of the other systems have as many but can't use them. And MIS uses a larger power supply than most lower priced systems.

The conclusion that should have been reached is that while the MIS 486 DX/33 system is not as fast or inexpensive as some of the other 486DX/33 systems, it offers the most expansion and technical capability. And it's backed by excellent support and service.

Please ask the editors who evaluated these systems to install nine storage devices, 64MB of memory, a 256K cache, a fax-modem, and an ethernet card in each of the other 24 systems. From the data presented, the MIS is the only one that will provide this much value.

Emmett Smith, sales and marketing manager, MIS Computer Systems

Editor's response: Most of your points are well taken. Certainly a slower 486-33 is still a fast system, and, in fact, the MIS scored very well on *dBASE* compared with the other 486-33s. The overall expandability of the system is also good, especially because of the SCSI adapter and nine drive bays.

While the inclusion of a SCSI adapter is a benefit for those who plan to add SCSI devices, anyone can add a SCSI adapter to a system for a minimal cost. Furthermore, those systems with comparable numbers of drive bays had more available slots and prices from $250 to over $700 less. We should also point out that the motherboards used by all the less-expensive 486-33 systems in the review are also from leading suppliers or the system manufacturer.

Although the price of the MIS system was the major factor in its evaluation, many of its other features were on par with other 486-33s reviewed.

The Greatest Thing Since Ice Cream

Your November issue was one of the most informative yet. The credit goes to your shift toward a more real-life emphasis. I can't estimate the amount of money I've dropped for software on the basis of good ratings in magazines—only to find that I, a lay user, could get it to work only if I was already an expert in that kind of software.

In "Presentation Software Playoffs," your reviewer made a comment that succinctly portrays the weakness of most magazine reviews. "Blinded by its many features, we might have given Lotus's DOS product [*Freelance Graphics for DOS*] a decent rating. Our guest reviewers, though, weren't fooled. Sylvie Solard called it 'horrific,' adding 'I never want to touch it again.' "

I recall a program I purchased to fill out forms. It got great reviews and an editors' choice. The software did everything the hype and reviewers said it would, but no one mentioned how annoying it was to use.

I see that an upgrade to this program is available at a bargain price. Will I bite? Nah. Fool me once, shame on you. Fool me twice, shame on me. I'll wait till your guest review panel tells me it's the greatest thing since homemade ice cream.

James J. Fox, Juneau, Alaska

Editor's response: We are continuing to use guest review panels when we look at product categories in which ease of use is important. Take a look at the review of fax software in this issue.

Nerd Police

Kudos on the new format unveiled in your November issue—it's well organized and presented. Your depth of

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technospeak is right on the money. You should, however, go one step further by criticizing software vendors who foist unsatisfactory documentation off on customers.

Where is the force of your editorial police when it comes to documentation? Your staff has the expertise to work out the flaws; not all of us do. Vendors need to hire humans to complement the work of nerds.

John F. Brosnan, Jr.,
Raleigh, North Carolina

Dropped on Our Heads?

You must have been out of your minds to test multitasking operating systems on such obsolete equipment ["Windows Alternatives," October 1992]. The conclusions you drew don't follow from the tests you ran. It's one thing to see how well software runs on low-end equipment, but to conclude that OS/2 isn't up to scratch based on such a test is absurd. The 286 you tested, given today's market, is little more than a toy, and even the 386s you used are rapidly becoming obsolete. If you were really interested in assessing performance on low-end equipment, you would have used a 386DX-40 with 8+MB RAM and 486SXs with 8+MB RAM.

Your review says, "But OS/2's desktop is befuddling in its flexibility. For instance, you can move a file from a window of file icons . . . to another window containing program-launching icons . . . . As a result, it's not really clear where the file is—did you physically move it? And if so, where to?" Come on, people! Were you dropped on your heads too often as infants? If you're not capable of anything better than that, I don't think I'll be wasting any more time or money on your magazine.

R. E. Byers, Singapore

CUBE Rebuts Its Review

I am writing to express my surprise and dissatisfaction with the November review of the CUBE 433 ATX Upgradable system ["Best Choice: 486DXs or Upgraded 486-SXs?"]. CUBE believes that the observations regarding our system and its test results were inaccurate and damaging to our hard-earned reputation for producing high-quality, high-performance systems.

The CUBE 433 ATX is a fast, *Windows*-oriented system. Its standard video board is the Orchid Fahrenheit 1280 graphics accelerator with 1MB of VRAM. I asked how the CUBE could do so poorly with its high-performance components and was dismayed to learn that *PC World* uses benchmark tests designed around *Windows 3.0*. Had you told us that your testing procedures were so far behind the times and allowed us to opt out of the review, we surely would have.

PC World commented that the CUBE system is fairly expensive, which is true. However, no mention was made that you get an outstanding Lexmark keyboard or a Sony Trinitron monitor—both of which have won industry awards and are representative of the highest quality, most reliable products around.

CUBE consistently offers the highest quality systems, reasonable high-end performance, and an attractive overall package for users who want long-term reliability and daily satisfaction from their system. Not everyone is interested in price; most people today are interested in value. We know

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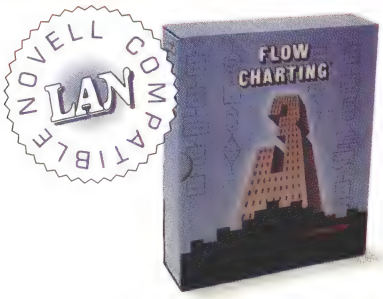

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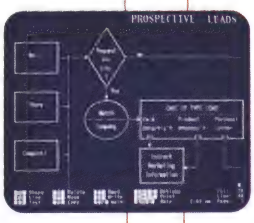

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3 The Omitted Form
Even "ordinary" returns require anywhere from six to a dozen forms to complete. It's easy to miss one ... or end up rushing all over town to find the one you need.

4 The Misinterpreted Instruction
At best, IRS instructions can be tough to understand. At worst they can be mind-boggling. What you need are clear directions in plain English.

5 The Overlooked Deduction
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6 The Exceeded Guideline
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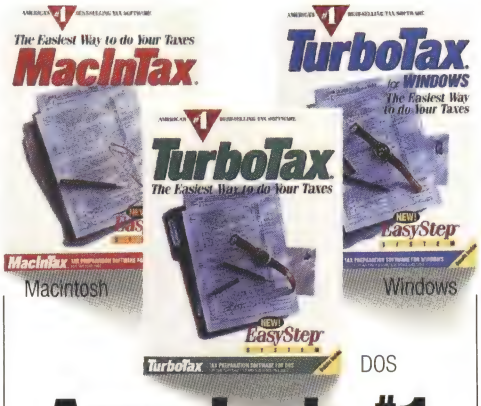

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PC MAGAZINE EDITORS' CHOICE FEBRUARY 25 1992 TURBOTAX FOR DOS

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CUBE systems will be working for years because we use the best components.
Michael Barr, vice president, CUBE Computer Corporation

Editor's response: While our readers find significant value in long-term reliability, we can't assess this quality in new systems. Our reviews take place over a period of months, and long-term reliability must be measured in years. It's true we made no mention of the high-quality components used in the CUBE system, and we regret that.

Our previous benchmark tests did include a component based on *Windows 3.0*—as did some tests used by other magazines at that time—but we now have developed a state-of-the-art test based around *Windows 3.1* that has been used in our reviews since January 1993. Despite the use of the *Windows 3.0* test in the November review, the results are still valid in that the relative performance of systems is measured. The CUBE system finished in the bottom five systems overall.

Almost all the systems reviewed used some form of graphics accelerator board, so the use of an Orchid Fahrenheit 1280 in the CUBE system did not make it stand out. We stand by our conclusions regarding performance and price on the CUBE system.

Utopia Gets a Dose of Realism

How unfortunate that *PC World* faults document imaging in a single stroke because it fails to live up to an editor's dream [see the sidebar "Searching for Utopia" in "The Less-Paper Office" in October]. Imaging is a proven and increasingly popular technology. Software vendor Keyfile was up front about its product being sold strictly through VARs (value-added retailers) with the experience to tie multiple technologies together. Enlisting the support of such a VAR would have brought a dose of reality to your experiment.

Then there is the $42,358 shopping list. Why calculate the cost of imaging so that it carries the cost of PCs, hard disks, network cards, a laser printer, and even *Windows?* I don't recall that arithmetic being done with spreadsheets and word processors. And by the way, today a Xionics image accelerator card for this system would cost less than $2000, not the $4850 of a year ago.

Finally there is the review by innuendo. Why talk about "strained" system performance without mentioning numbers? Where is the comparison of hours spent filing, retrieving, photocopying, and losing documents in a paper system versus one-time scanning and indexing for fast shared access to images in an electronic system?

PC-based document imaging is the fastest growing segment of the multibillion dollar electronic-imaging industry. Xionics continues to achieve double-digit growth selling image accelerator cards to OEMs, VARs, integrators, and even technically savvy users. How about looking at document imaging in the real world?
Brian Bissett, vice president, marketing, Xionics

Editor's response: The purpose of our sidebar was to look at document imaging in the real world by attempting to reduce the use of paper in our own office. We hired an expert with VAR experience to set up the system. Our expensive shopping list was ▶

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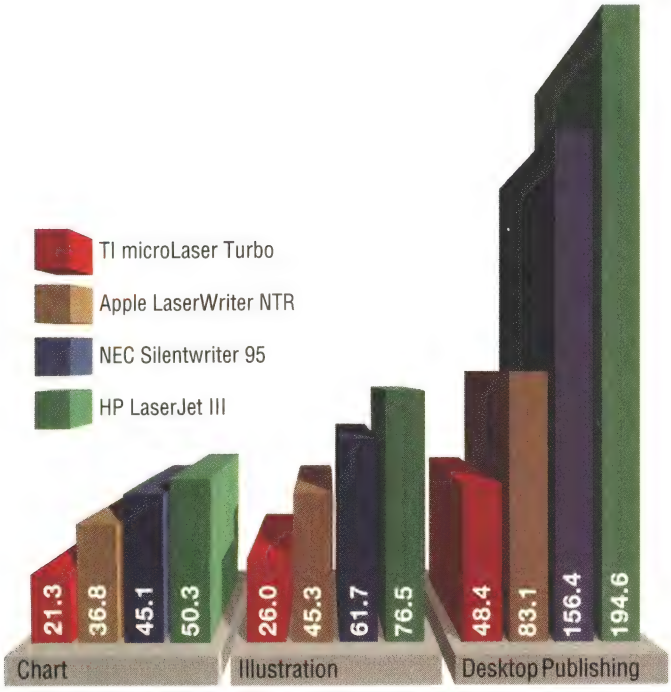

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dictated by the volume of material we anticipated cataloging and managing. Quite simply, our current network—while adequate for E-mail and file sharing, and while more sophisticated than many—was not up to the task. Nor was there such a thing, in our experience, as "one-time" scanning.

There are numerous solutions to the document imaging conundrum, and they offer varying degrees of usability and cost. Document imaging has the potential to become the solution we are all awaiting, and we'll continue to examine the issue in the months ahead.

Corrections and Clarifications

Because we misplaced a fact-checking file, there were some errors in the Features Comparison in the December review "Best Monitors for $1000."

The list price for the Amdek AM/815 is $799, and this monitor does not meet SWEDAC emissions standards.

Daily support for Dell's 15LR is 18 hours.

The HP Ultra VGA 17-inch Display does manually degauss, HP has fax support, and HP doesn't have a turnaround policy.

The NEC MultiSync 4FG has a control to correct pincushion/barrel convergence.

The list price for the Relisys RE1558 is $845, and it has a 12-month warranty and a turnaround policy of five working days.

The turnaround policy for the Samsung SyncMaster 5c is seven days.

The Taxan Multivision 550 has daily support 8 hours a day, and its turnaround policy is five to seven working days.

Electronic BBS support is available for the ViewSonic 7.

In "Fast Video for Less" in December, we listed an incorrect phone number for Young MicroSystems. The correct phone number is 310/941-9888.

In December's "486SX-25s vs. 386DX-40s: The Upstart Fights Back," the contact listed for the Tangent Model 340 was incorrect. For information about the Tangent, call 800/800-6060 or 415/342-9388.

In December's "The Readers' Choice: World Class 1992," we misspelled the photographer's name in the credit on page 118. His name is Richard Loper. In December's *Real Problems, Real Solutions*, we misspelled our guest problem-solver's name: It is Howard Moskowitz, with a *k*, not a *c*.

In December's *New Products*, we listed an incorrect price and model number for the Quick Take item on Adaptec's SCSI Master Plus. Its price is $466, and its model number is AHA-1524.

Due to an editing error, a January *Top of the News* article on Microsoft incorrectly cited the Software Publishing Association as the source for information concerning the percentage of *Windows* software sold by Microsoft. The SPA does not release this information; the figure was obtained from an analyst.

PC World regrets the errors.

Mail your reactions, responses, and ideas to Letters, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Letters; CompuServe, 74055,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax). Include your name, city, state, and phone number. We reserve the right to edit letters.* ■

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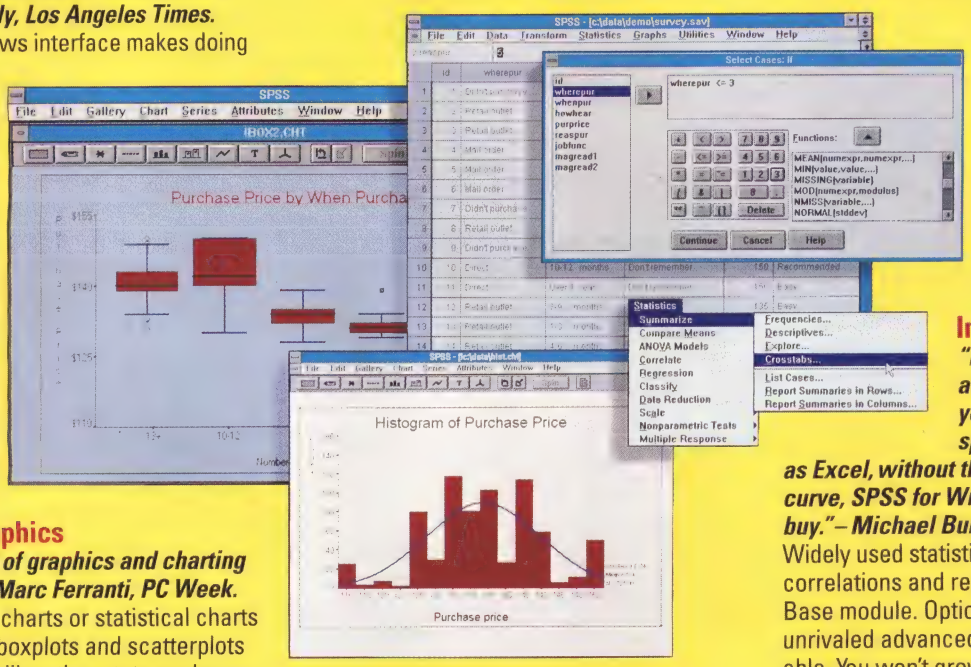

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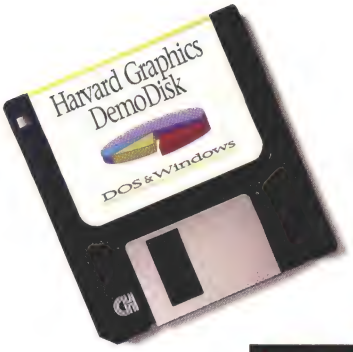

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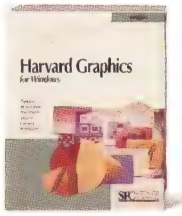

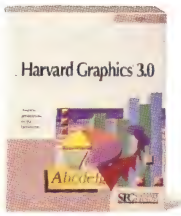

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In Search of Relief for Tired, Aching Eyes

According to a recent survey of U.S. optometrists, an estimated 10 million Americans visit eye specialists each year for VDT-related vision problems, or what one glare-filter manufacturer has termed *computer vision syndrome* (CVS). "Vision problems are the most frequently occurring health problem among VDT workers," says Dr. James Sheedy, associate clinical professor of optometry at the University of California at Berkeley's School of Optometry and chief of the university's VDT Eye Clinic, dedicated exclusively to the study and treatment of VDT-related eye problems.

Any type of close-up work that entails staring at a fixed point for hours takes its toll on your eyes. But, says Sheedy, "VDT work is particularly demanding." Students poring over textbooks and drafters working on a design can change positions periodically for optimum comfort and lighting. The PC user doesn't have that option. For the majority of us, the monitor stays in one spot at a fixed distance from the eyes, presenting such unique irritants as glare and flicker.

When Eyes Fail You

Eyestrain, headaches, blurred vision, and dry or irritated eyes are the most common side effects of extended VDT work, according to Sheedy's survey of members of the American Optometric Association. Doctors responding to the survey said that for nearly 40 percent of their VDT-using patients, vision problems were the direct result of "environmental factors, such as lighting, poor screen resolution, glare, etc." To that list Sheedy adds such contributing factors as poor workstation design and extended hours of uninterrupted computer use.

Flicker can also be a significant cause of eye fatigue among computer users. Most monitors repaint the screen 60 times per second (60 Hz)—generally considered the minimum acceptable *refresh rate*. Many users argue, however, that even this level produces a noticeable flicker—and subsequent eyestrain. For this reason, most new video boards and monitors support at least 70-Hz refresh rates. (If monitor flicker bothers you, check the specs on your monitor and graphics board. If you're lucky, they may already be able to do 70 Hz or better, and a simple setup change can produce a more stable image. Otherwise, consider upgrading to a graphics board and monitor that support higher refresh rates.)

by Roberta Furger

ROBERT HOLMGREN

PC World Consumer Watch editor Roberta Furger

In extreme cases—like many types of extended close-up work—extended VDT use can bring on myopia or nearsightedness, which can be helped only with prescription lenses. Fortunately, current research indicates that most VDT-related vision problems are short-term and can be alleviated or reduced by a change in work habits and office setup, and in some cases by obtaining a prescription for corrective lenses that you can wear while working at your computer.

Sheedy and others also recommend routine eye examinations for anyone who uses a computer regularly. When possible, see an eye specialist who is familiar with VDT-related problems and make sure you provide your doctor with a detailed description of your job and your work environment.

See "Not for Your Eyes Only" for a commonsense list of things you can do to ease eye strain. Often, something as simple as changing the position of your monitor or reducing office lighting can go a long way toward alleviating VDT-related vision problems. But not everyone has the freedom to make some of the recommended adjustments. In these instances, says Dr. Stephen Miller, director of the American Optometric Association's Clinical Care Center in St. Louis, a glare filter can be a simple and effective way to fight eye fatigue. Not only do these filters reduce eyeball-bending glare, some also claim to make flicker less perceptible.

Quick and Easy Glare Reduction

Glare filters come in three basic varieties: mesh, glass, and plastic. All filters darken the screen, but glass and plastic units usually make up for it with enhanced contrast. Most eye specialists recommend glass filters, since they tend to distort the image far less than mesh varieties, which can produce a moiré pattern on screen, an interference pattern that Sheedy refers to as "the screen door effect." Glass and plastic filters have two drawbacks, though:

They're more expensive and more reflective than mesh—so in extreme lighting, the filter may produce more reflections than the naked monitor. Casual users, people who don't want to spend much for a product, or users in harsh lighting conditions should consider mesh.

The only way to know if a filter will meet your needs is to work with it on your computer for a few days. To help consumers make a more educated decision, the American Optometric Association began a Seal of Certification and Acceptance program to judge the effectiveness of filters. To date, only one company, Optical Coating Laboratory, Incorporated, has submitted its products for review. All the OCLI filters have received the AOA seal.

Virtually every filter manufacturer offers both mesh and glass products. Along with reducing glare, some filters are supposed to cut static, which means they prevent charged dust particles from collecting on the surface of the monitor. Others claim to block potentially harmful electromagnetic emissions. We didn't measure emissions levels here, if only because these filters cannot block rays from the back of monitors—the greatest source of low-frequency emissions.

To measure the effectiveness of glare filters, we had 12 *PC World* editors—a demanding group, because they often spend hours hunched over their monitors—use a filter for a month and then report on their experiences. A few of the editors had used glare filters previously, but none had a unit installed at the beginning of the study. The lighting in our offices varies considerably from one cubicle to the next. We have fluorescent lighting overhead and windows stretching along the exterior walls of the building. Each cubicle is also equipped with task lighting.

"After installing the glare filter, my screen immediately looked flatter and darker, as if I were wearing sunglasses."

Most of the editors reported reduced glare and, in many cases, reduced eye fatigue after installing their filters. "With the filter installed, I can work on my system all day with virtually no eyestrain and without having to position the monitor away from the sun's path," notes Assistant Managing Editor Anne Kandra.

And you couldn't ask for easier products to install. "My first impression of the instructions was that they were inadequate," says Associate Editor Lincoln Spector. "But the filter turned out to be so easy to install that it didn't matter." Filters come in three basic designs: They attach directly to the front of your monitor, hang from the top, or fit like a glove over the bezel. The latter, so-called contour models, may be the best choice if you have a monitor with a curved bezel, because they can block light coming in from the sides.

Our evaluators also pointed to some common problems with the products, particularly their noticeable darkening of the screen. "Immediately my screen looked flatter and darker, as if I were wearing sunglasses," said Assistant Editor Christina Wood, after installing a filter on her NEC MultiSync II monitor. While making the adjustment was difficult at first for a few editors, most of them felt they could live with the results simply by adjusting the monitor's brightness and contrast.

Prices vary considerably among the filters we evaluated—from $28.50 to $140. Except for a few extreme cases (where individuals sit adjacent to large windows, for example), low-price units seemed to be as effective as their more expensive counterparts. And regardless of what type of filter they installed—

A Filter for Every Monitor

OCLI'S GLARE GUARD Professional Plus's contour design fits snugly over the monitor. For units with curved bezels, this design is most effective at blocking outside light.

THE KANTEK ERGOVISION2 mesh filter's front-mounting design can attach to the face of the monitor or on top. The grounding wire provides antistatic protection.

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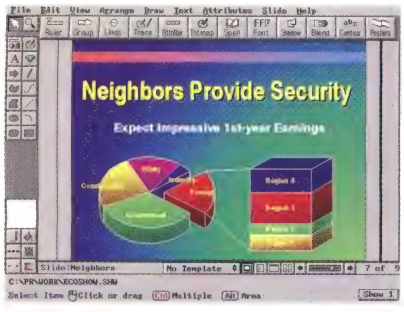

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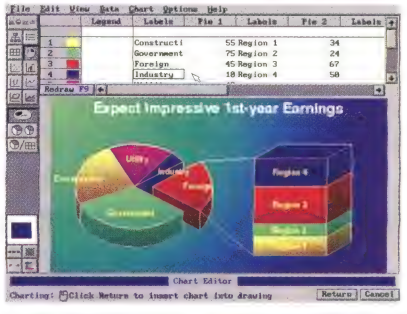

Unlike other programs, you don't have to navigate back and forth between the data input screen and your chart. With the Split Screen Editor, changing the data on top instantly changes the chart below.

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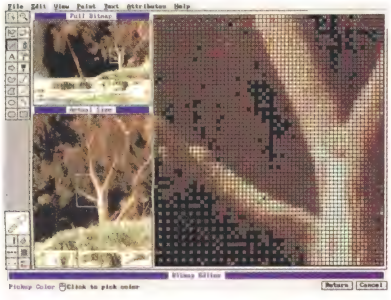

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Not for Your Eyes Only

Many eye problems related to VDT use can be alleviated by a few commonsense adjustments to your workstation and work habits. Following are several guidelines that can help you make screen work easier on your eyes:

• Check for flicker. Flicker can be one of the primary causes of eye fatigue. If you notice a flicker on your display, you may need to upgrade your graphics card or monitor to support a higher refresh rate. (The PC graphics community recommends using a monitor with a minimum refresh rate of 70 Hz.)

• Adjust the height at which your monitor sits. For optimum comfort and minimum strain, adjust your monitor's position so the top of the screen is at eye level.

• Keep your distance. The most comfortable viewing distance varies, but eye care specialists generally recommend sitting 18 to 24 inches away from the screen. If you need to sit closer to see the text, visit your eye doctor; you may need special VDT glasses.

• Control harsh lighting. Position your monitor so light hits it from an angle. Avoid having any direct light source (such as a lamp or window) either behind you as you're looking at the screen or directly behind the monitor itself. When possible, reduce overhead lighting by either turning off some lights or removing every other bulb from fluorescent light fixtures.

• Don't go overboard on resolution. Running your monitor at higher resolutions (particularly 1024 by 768 on standard 14-inch screens) makes for extremely small type that can be difficult to read. Consider dropping your monitor's resolution down a notch to allow easier reading.

• Take regular breaks. Eye specialists recommend taking a 5- or 10-minute break after every 2 hours of continuous computer use. Do some paperwork, take a walk, and give your eyes a chance to focus on distant objects. The time away from your desk will do your eyes—and your blood pressure—some good.

mesh or glass, inexpensive or pricey—the editors haven't offered to give back their demo units. With this bunch, that's probably the strongest recommendation of all.

The following companies offer antiglare products for a range of PC monitors. While most sell filters, others offer less standard models, such as a visor that wraps around the monitor or filters that install behind the bezel.

- **Advanced Environmental Systems;** 415/626-1625
  Reader service no. 697
- **Ergotech;** 800/729-1345
  Reader service no. 698
- **ErgoView Technologies;** 800/888-3537
  Reader service no. 699
- **Fellowes Manufacturing;** 800/945-4545, 708/893-1718 (fax)
  Reader service no. 700
- **Kantek;** 800/536-3212, 516/593-3212
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- **I-Protect;** 800/733-2537, 310/215-1664
  Reader service no. 702
- **NoRad;** 800/262-3260
  Reader service no. 703
- **Optical Coating Laboratories, Inc.;** 800/545-6254
  Reader service no. 704
- **Polaroid Corp.;** 617/446-4600 (fax)
  Reader service no. 705
- **Sunflex;** 408/522-8850
  Reader service no. 706

PC World *staff members Michael Desmond, Thomas Gewecke, Mike Hogan, Anne Kandra, Karl Koessel, Richard Melville, Shane Rau, Melissa Riofrio, Susan Silvius, Lincoln Spector, and Christina Wood contributed to this article.*

Shop Talk

By Any Other Name . . .

I was considering purchasing a 486DX-33 from FastMicro, but after your comments in "Readers Rate Direct-Sale Vendors" and the review "Best Choice: 486DXs or Upgraded 486SXs?" in the November 1992 issue, I am not inclined toward this vendor. I wrote to FastMicro asking for additional information, but they didn't respond.

There is a very similar system by a company called RiteMicro, also in Phoenix. Their advertisements say they have been in business for six years, but I can't find any of their previous advertisements. Can you tell me anything about them?

Evan L. Davis, Jr.,
Issaquah, Washington

Editor's response: RiteMicro is a subsidiary of FastMicro, a company that has been the subject of dozens of letters to *Consumer Watch* over the past year and for which we continue to receive complaints. We have also received numerous inquiries and a handful of complaints about RiteMicro since it began advertising in *PC World* late last year. As with FastMicro, these complaints have dealt with customer service–related problems.

Although we have forwarded letters about RiteMicro to FastMicro for resolution, the company has not responded to any of them. And although salespeople at both companies have explained their relationship without hesitation, we have been unable to get a formal response from FastMicro executives.

The Better Business Bureau in Phoenix (the city in which both FastMicro and RiteMicro are located), gives both companies an unsatisfactory rating and does not condone or recommend purchasing from them due to unresolved complaints, according to a spokesperson.

Effective with the January 1993 issue, neither RiteMicro nor FastMicro advertises in *PC World*.

Down, But Not Out of Touch

When I read about Wang Laboratories filing Chapter 11 bankruptcy last year, I was concerned that I might run into trouble when I needed customer service assistance or warranty coverage. In fact, just the opposite was true. When I wrote to the customer service

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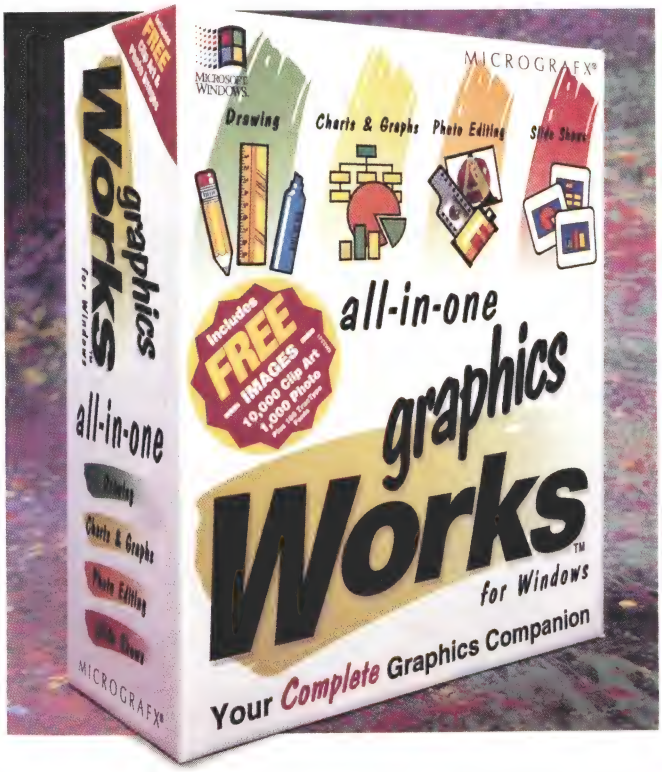

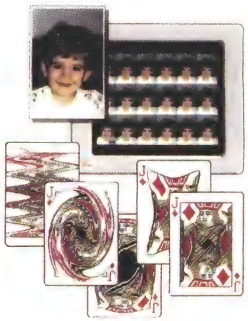

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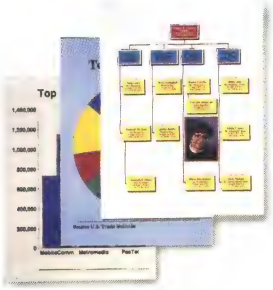

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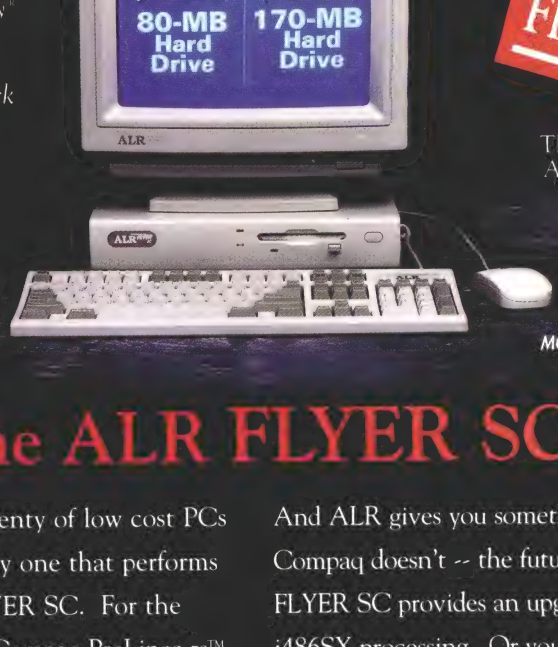

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manager about a problem I was having, I received a prompt response and exceptional service.

Your column all too often reflects the rip-offs that are happening. I thought it would be nice for the public to know that they can still depend on the older, well-established companies even in times of adversity.
Emanuel Wolin, Margate, Florida

Cash Discounts: Not Worth the Risk

In response to an advertisement, I called A-Tronic Computer in City of Industry, California, to ask about a 486-50. The salesperson offered me a discount if I paid cash, so I sent a cashier's check for $1559.

I received a postcard confirming the order and ship date. The ship date came and went, so I called to speak to the salesperson who took my order. I was told he was on the phone and would call me back. He didn't.

I called again repeatedly, only to get a busy signal. Finally I got a recording telling me the phone number had been disconnected. How can I get my money back?
Jane F. Powell, Baltimore, Maryland

Editor's response: Unfortunately, you probably won't be able to recover the money you sent A-Tronic. According to sources, the building where the company operated is vacant, and at least one creditor is owed several thousand dollars. Although the Postal Service lists a forwarding address in Fort Lauderdale, Florida, directory assistance has no number for an A-Tronic Computer in that city.

To date, the Federal Bankruptcy Court in Los Angeles has no record of the firm having filed for bankruptcy.

Cash discounts, such as the one offered by A-Tronic, can be enticing because they often mean a savings of several hundred dollars. But such deals are used frequently by companies looking for a quick infusion of cash—either to buy the equipment necessary to fill orders or to get out of town fast. Better to pay the full price using a credit card or COD. That way, if something goes wrong, you'll be out your time but you won't be out your money.

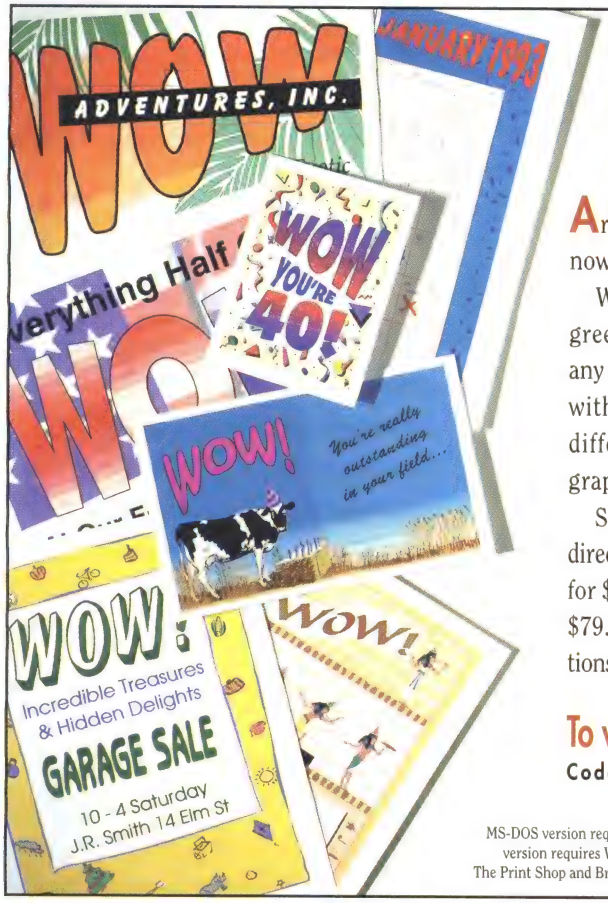
One final note: A-Tronic Computer is not affiliated with ATronics Int'l in Fremont, California, whose computer received a *PC World* Best Buy in the January 1992 issue.

Prodigy Billing Practices *Questioned*

In June 1991 I decided to get a one-year membership to Prodigy. Prodigy's credit-card plan stipulated that unless the member advised otherwise, the membership would be renewed automatically. Wishing to use my credit card, but not wanting my membership to be automatically renewed, I sent Prodigy's customer service department an E-mail message asking them to sign me up for a one-year membership, but not to renew it unless I requested they do so.

In June 1992 I sent another message to Prodigy inquiring about the status of my membership and reminding the company that I did not want it renewed automatically. I was told that the membership had already been renewed, but that I could receive a refund if I requested it.

The most disturbing aspect of this misunderstanding was that the credit card I used when I opened my Prodigy account is linked to my checking account. Bills are ▶



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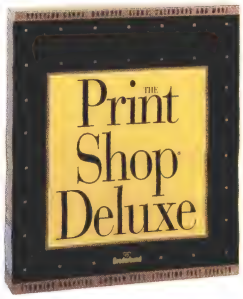

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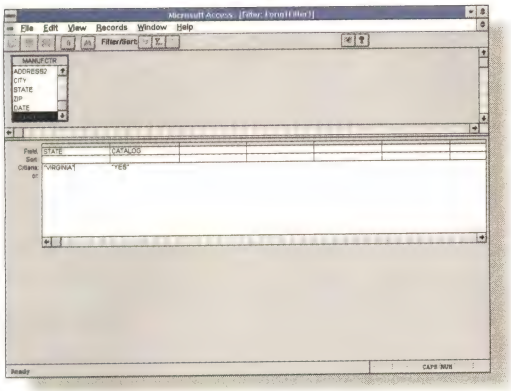
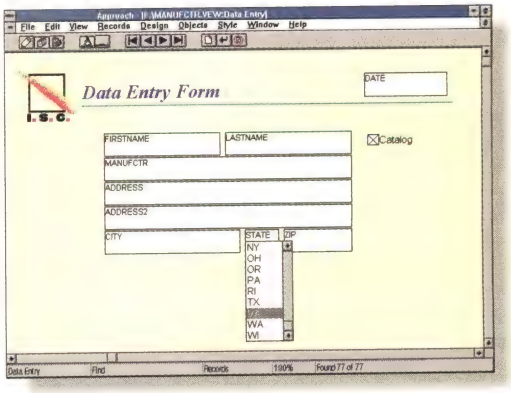
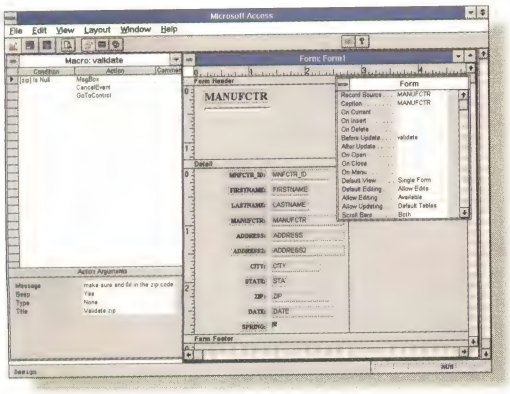
RESTRICTED ACCESS VS. THE DIRECT APPROACH



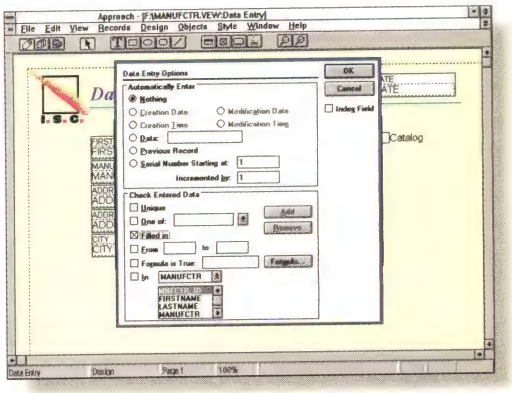
With Access, to find all Virginia suppliers in your catalog:
1) Choose Filter/Sort. A different screen appears, placing you in Filter mode.
2) Indicate the field you wish to filter on by dragging "STATE" into the table.
3) Type "VA" to enter your 'criteria'.
4) Indicate the second field you wish to filter on by dragging "CATALOG" into the table.
5) Type "yes" to enter your 'criteria'.
6) Click the Filter/Sort button. Results appear, but with no info on the number of records.



With Approach for Windows:
1) Choose Find for a blank form identical to the one you're using.
2) Choose "VA" from the pull-down list and click on "Catalog".
3) Hit Enter. Results appear with a note on the total number of Virginia suppliers.



With Access, to require that the zip code field always be filled in:
1) Create a new macro.
2) Click the Conditions button to display conditions.
3) Type "[Zip] Is Null". Tab to Action and enter "MsgBox".
4) Type an ellipsis (...) for the next Condition and enter "CancelEvent" under Action.
5) Type another ellipsis and "GotoControl". Type "Zip" for your 'Action Argument'.
6) Correct any syntax errors and save your macro.
7) Go to the form which includes the 'control' that requires filling in. Obtain its properties.
8) Click in BeforeUpdate and enter the macro's name.



With Approach for Windows simply:
1) Choose "Options" under "Field Definition".
2) Check "Filled in".

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And whereas programmers may enjoy poring through all 543 pages of the Access 'Language Reference' manual, *Windows Magazine* wrote "Approach is one of the few software packages where it is truly possible to never open the manuals."

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debited directly, so Prodigy was able to remove more than $120 from my checking account without my knowledge or consent.

Although I have not signed on to Prodigy since June when my account was fully paid, I am now receiving bills advising me that my account is overdue.

Warren Schlam, Rome, New York

Editor's response: According to Prodigy Communications Manager Brian Ek, Schlam's billing error has been corrected. He notes that Prodigy continues to issue charges for service unless the member cancels. "Members can discontinue service at any time, regardless of term, and receive a refund of any unused portion," he adds.

Think you've gotten a raw deal—or a great one? Mail the details to Consumer Watch, PC World, *501 Second St. #600, San Francisco, CA 94017; or send them electronically to PC World Online, Consumer Watch; MCI Mail, PC World Editorial; CompuServe, 74055,412; or 415/442-1891 (fax). We'll investigate complaints and publish letters with the broadest interest.* ■

BUG WATCH

CompuAdd Notebooks

Internal modems in some CompuAdd 325tfx and 425tfx notebooks won't work when peripherals are attached to the PC.

Until CompuAdd can make a fix available to users, the company advises anyone who owns either of these models and is experiencing problems with their internal modem to disconnect all peripheral cables from the notebook before attempting to use the modem.

CompuAdd; 800/999-9901

Grammatik 5 and WordPerfect 5.1

An intermittent bug in the Bookmark feature of *Grammatik 5 for DOS* can destroy portions of *WordPerfect for DOS 5.1* files. When you remove a *Grammatik* bookmark from a *WordPerfect 5.1* file, text following the bookmark may be lost.

A fix is available free from Reference Software, maker of *Grammatik*. If a document has been corrupted by the bug, check the *Grammatik* directory for a backup of the file (*.GBK), created automatically at the start of each editing session.

Reference Software Int'l; 415/541-0226

ATI Mach32 Video Driver

Conflicts between the recently released *Mach32* driver for ATI's Ultra Pro local bus video board and the HP DeskJet printer can cause incomplete print jobs and missing text if you're using TrueType fonts.

ATI will include a fix in the next version of the driver, though a company spokesperson could not give a delivery date.

ATI; 416/756-0718 (Ontario, Canada)

—Richard Melville

Richard Melville is an editorial intern.

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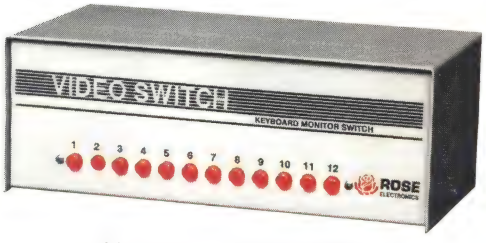

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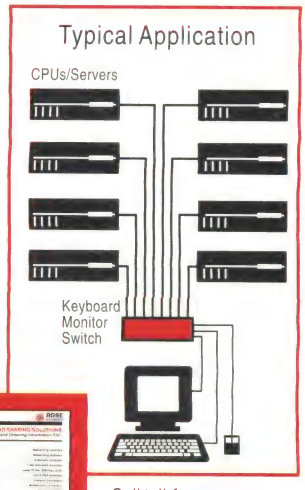

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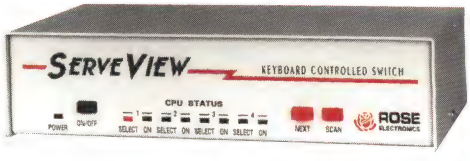

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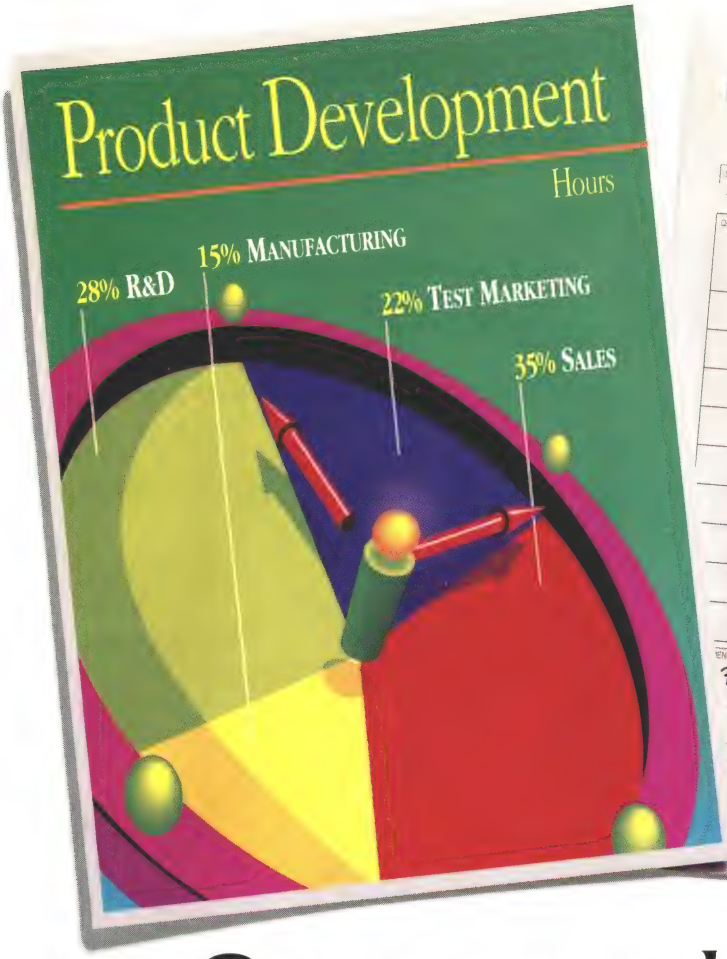

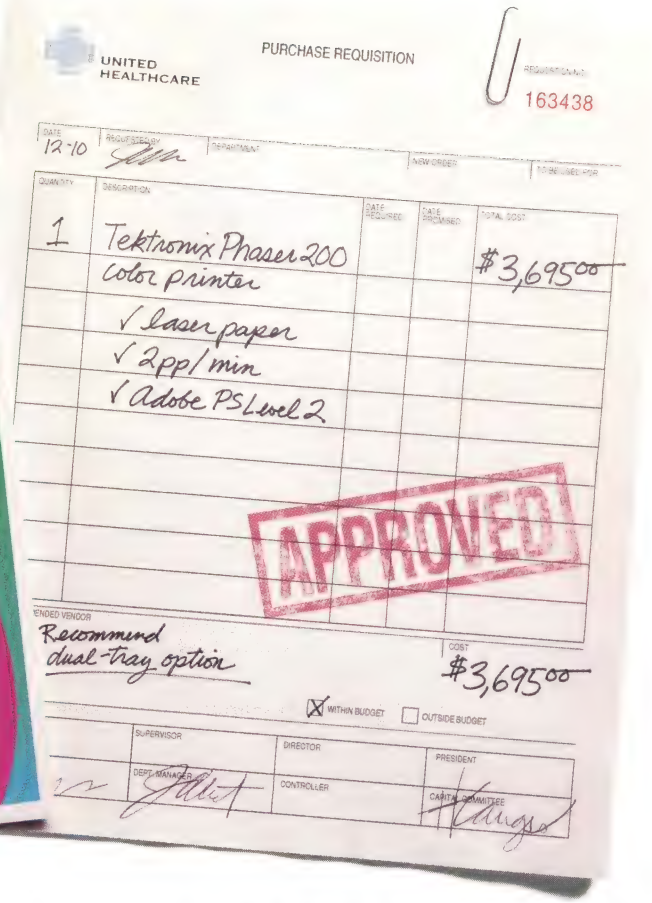

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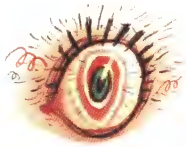

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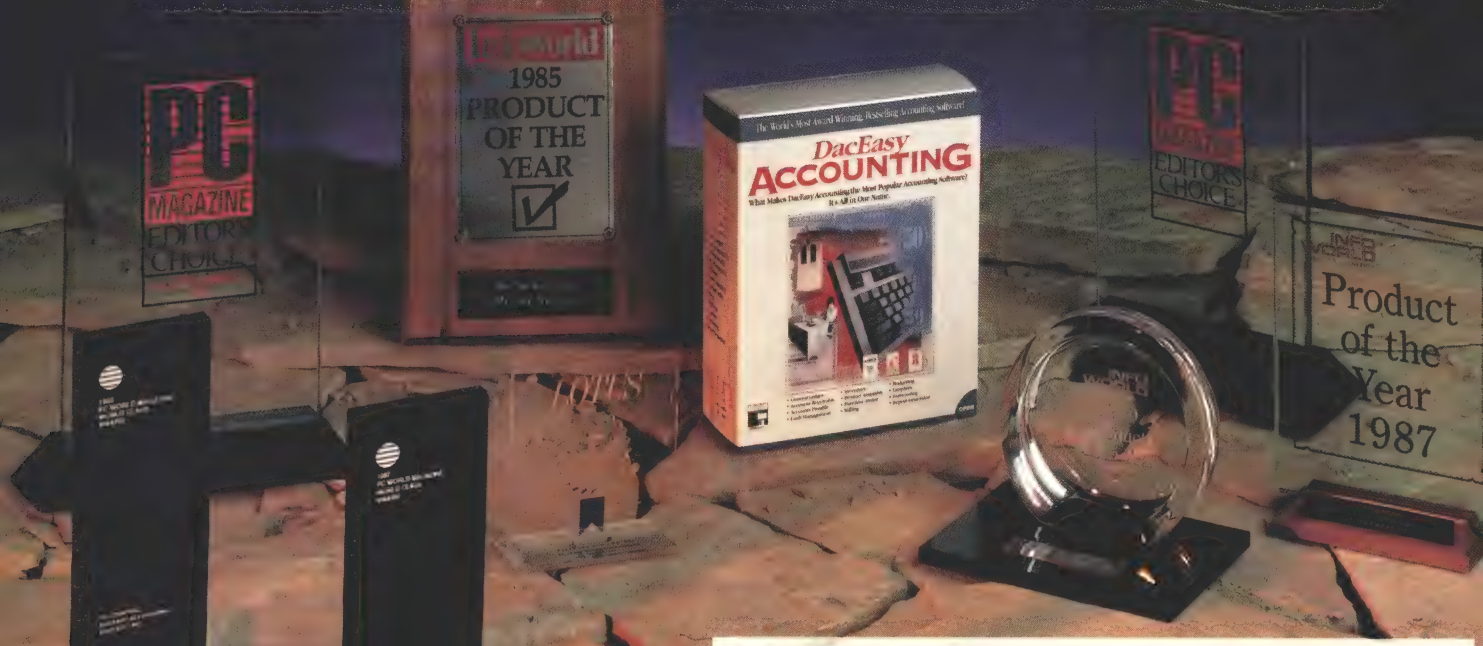

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MEDIA CODE: PCW

Evolving an Upgrade Strategy

It's a problem that every company has to face sooner or later: What do you do with your old PCs when you step up to the next hardware platform? This month Heather Krause, CAD coordinator for Smith & Loveless, discusses how she helped establish a policy for distributing computing resources at her firm, a Lenexa, Kansas-based manufacturer of water and wastewater treatment and transfer equipment. —*Ed.*

When it comes to buying new hardware at Smith & Loveless, we're pretty conservative. With only 35 PCs for 140 employees, we need to wring as much productivity from our existing machines as we can. We buy new systems for two reasons: if a PC breaks down and is no longer worth fixing, or if we really need a piece of software that requires more horses than we have in our stable.

Since engineers are at the top of the PC food chain here, upgrade requests usually originate in my department, which is how I got involved in this process. (While my main responsibility is training our engineers to use CAD programs, I've become kind of a one-person support staff for our PC users.)

We have everything from ancient IBM PCs to state-of-the-art 486s, but until recently the upgrade process was fairly haphazard. Hardware requests were handled by individual department managers, who passed them on to the finance people at the top. The end result: Some users got more computer than they really needed, while others got no computer at all.

Identifying the Need

The need for an organized pass-along procedure became clear in August 1990, when I was helping the head of personnel upgrade his system. He had an original IBM PC with an external 10MB hard disk. The slow CPU and minuscule storage space were cramping his ability to handle big spreadsheets. Clearly it was time for him to get new equipment. At that time the ground-level business systems were 286s, but I felt we shouldn't buy anything less than a 386.

It didn't make a whole lot of sense to upgrade him to a 386 to run *1-2-3* and *WordPerfect* when we had engineers running *AutoCAD* on 286s. That's when I came up with the idea of a centralized system for upgrades throughout the company. Whenever we bought new systems, we could pass existing equipment down to people who needed a PC but could get by with less horsepower—our own trickle-down upgrade policy.

I wrote a memo to the manager of technical services, who passed it on to the president. He decided to implement the idea and put our engineering department in charge of arbitrating requests. Since I helped coordinate PC purchases for engineering and was familiar with hardware requirements, the requests came to me.

Once word got out, I had people clamoring for new machines—and, suddenly, a bunch of new things to worry about in my "spare time." Now that we've created a clearinghouse for hardware requests, we're getting a lot more use out of systems other companies might have thrown away, and we've expanded the use of computers throughout the company to people who might not otherwise have gotten one.

Implementing the Solution

Here's how the process works. When someone decides they need a new PC, they make a request detailing what they need to do their job more effectively. Once we decide the upgrade is justified and determine what kind of system to buy, we figure out what to do with their current machine. Fortunately, there's no shortage of users hungry for a more powerful computer—or any computer at all.

Heather Krause helps spread the PC wealth around at Smith & Loveless

With our tight equipment budget, we need to justify the upgrade on both ends of the equation before we spend the money. If our engineers want PCs that give them quicker redraws of CAD files, they'll have to bide their time until someone else needs their current systems. We feel strongly that you can get more productivity by customizing software and teaching people to use it more efficiently than by simply throwing more power at them.

When we get hardware requests, we consider two things: which user has the greatest need, and how the upgrade will improve the productivity of the company as a whole. We base our decisions on job functions, not job titles. For exam-

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PCW-2/93

Circle 212 on reader service card

ple, we may have a vice president who shares a PC but wants one of his own so he can spend more time crunching spreadsheets. At the same time we may have a secretary who works for several executives but still types letters on a typewriter. In that case, we'd probably give the machine to the secretary, since that's where we'd see the greatest productivity gain.

If all a user does is run *1-2-3* or *WordPerfect*, he or she will do just fine with one of our PCs, XTs, or 286s. We have a handful of 386s, which we've deployed in our sales and personnel departments, as well as one that we use as a file server in engineering. The 486s are reserved for those who need the most horsepower—drafters and engineers who live inside *AutoCAD* and other number-crunching programs, and the desktop publishers in our advertising department who run *PageMaker*.

The process worked so well with hardware that we decided to centralize our software purchase decisions as well. In the past, whoever used a particular piece of software in the company might evaluate a new version of the package and request an individual upgrade—not the most efficient method. Now we've set up a review committee made up of engineering and marketing personnel that evaluates software upgrades on a companywide basis.

This is essential now that we've begun work on our next big project: implementing an office automation system using a Novell NetWare LAN, with a centralized database and document management software. We hope to eventually triple the number of employees using PCs and hook them all together on the network within five years. At that point, we might even consider retiring some of our aging IBM PCs.

If you use PCs to manage people and other resources in a business environment, we want to hear from you. Send your article idea—including a brief outline of your company, job, problem, and solution as well as your name, address, and phone number—to Real Problems, Real Solutions, PC World, *501 Second St. #600, San Francisco, CA 94107; or send it electronically to PC World Online, Real Problems, Real Solutions; or 415/442-1891 (fax); or call us at 415/978-3224. We pay $300 per published column. Sorry, we cannot acknowledge submitted materials.*

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From Your Friends In The Business...

Thank you for making 1992 the best year yet for everyone at Gateway 2000. Because of your belief in us, we captured an unprecedented five ***Computer Shopper*** 1992 Best Buy Awards including Best Overall Vendor.

And in ***PC Computing's*** 1992 MVP Awards, Gateway was honored with the MVP Desktop System Award for our 4DX2-66V system. Thank you *PC Computing*!

We're much obliged to ***PC Magazine's*** readers who gave us the best overall score in *PC Mag's* 1992 Service and Reliability Survey.

Our humble thanks to the readers of ***PC World***. They honored us with two World Class Awards in 1992 – one for the Gateway 4DX-33 and another for Service and Support.

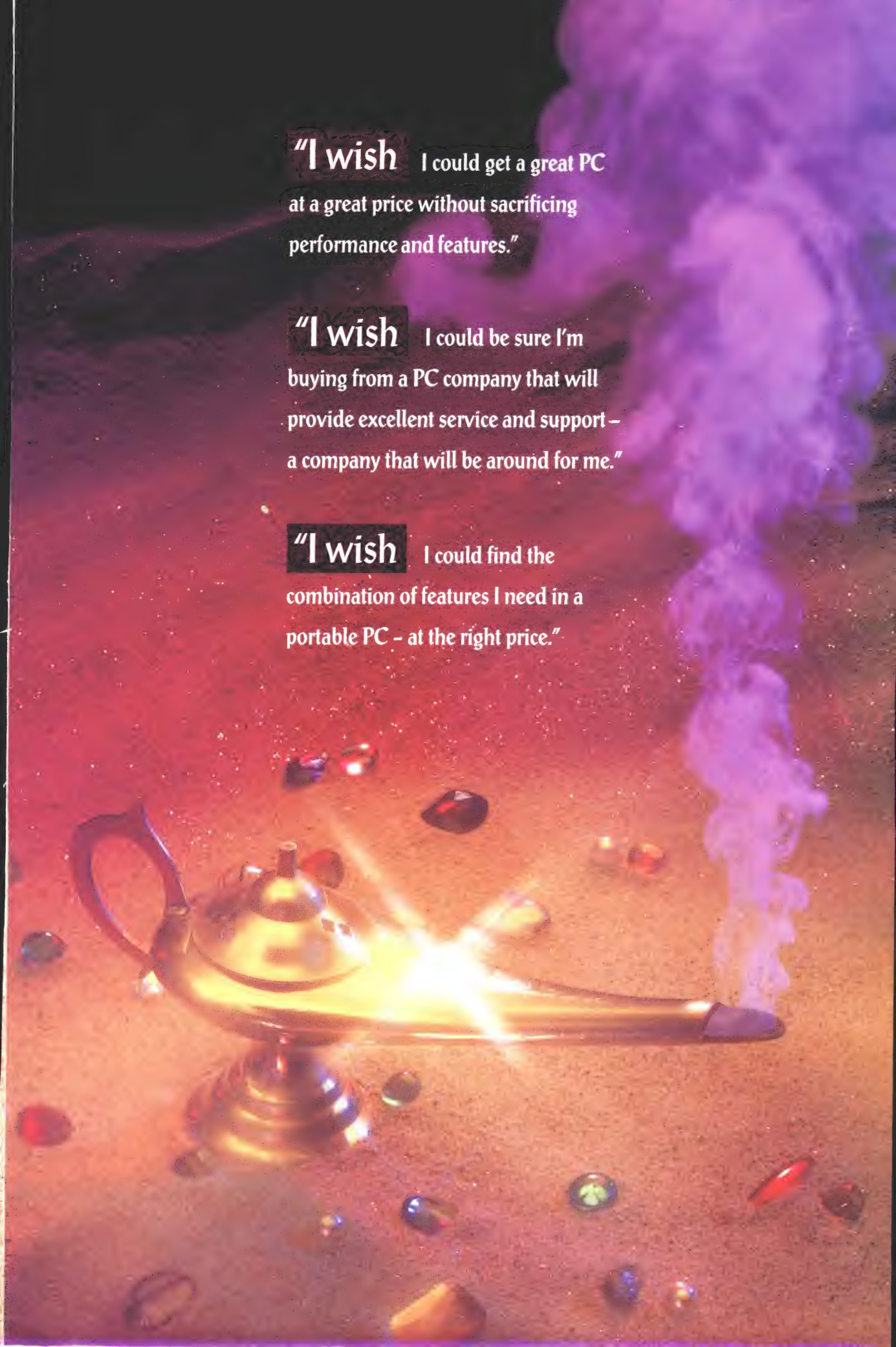
Our hats are off to ***Compute*** magazine for presenting us with 1992 Best Desktop Computer for the Gateway 4DX2-50.

We're thrilled that ***Popular Science*** magazine recognized the Gateway HandBook portable PC as one of 1992's "Best of What's New."

And thank you ***BYTE*** magazine for an Award of Distinction for the HandBook. *BYTE* readers also chose the Gateway 486DX as Desktop Computer of the Year.

Finally, we applaud all our loyal customers. Without your unwavering support throughout the years, Gateway couldn't have won these honors. We owe our success to you, and we'll be forever grateful. Here's to another great year in 1993!

GATEWAY 2000


"I wish I could get a great PC at a great price without sacrificing performance and features."
"I wish I could be sure I'm buying from a PC company that will provide excellent service and support – a company that will be around for me."
"I wish I could find the combination of features I need in a portable PC – at the right price."

Your Wish Is Our Command!

What Do You Wish For In A PC?

GATEWAY 2000

Your wish is our command at Gateway 2000! We can grant you the three most universal PC wishes in the wink of an eye. As a fringe benefit, we won't limit you to three wishes here. Most anything your heart desires in computers (sorry, we can't grant wishes for romance or riches), you can get from Gateway.

That's because we built our business by listening to our customers' wishes and doing everything in our power to make their dreams come true. At Gateway, we believe you should be able to *have it all*: the latest technology, glittering performance, quality construction, enchanting service and the fairest prices in the land. All this from a financially healthy company that won't run dry and leave you stranded in the desert.

You don't have to settle for less. With Gateway 2000, you can have it all. Draw up your wish list and give us a call. We'll make some truly magical values materialize for you.

GATEWAY 2000

Gateway Grants You The Most Wond

"I wish I could get a great PC at a great price without sacrificing performance and features." Your wish is our command!

You'll be spellbound by Gateway's ferociously competitive prices on systems that are unequaled in powerful performance, impressive features and graceful integration of components. Other companies make the same claims, but the truth is revealed when readers and editors of the most popular PC magazines are asked which company delivers on its promises. Their overwhelming response is Gateway 2000.

"Gateway has gone far beyond conventional ideas of price and performance. In doing so, it has created new rules that other PC makers will have to follow if they want to remain players."

– *PC Computing*, 1992 MVP Awards

"Gateway 2000 was the big 1992 Best Buy winner, sweeping not only the desktop awards as it did last year, but the newly expanded notebook categories as well ... Altogether, Gateway won five Best Buy awards this year, including Best Overall System Vendor ... It's no surprise that Gateway is consistently the people's choice when it comes to systems. Its formula for success is to sell fully configured PCs at aggressive, how-can-they-do-that prices, along with comprehensive service and technical support."

– *Computer Shopper*, 1992 Readers' Best Buy Awards

ous Value In The Land.

"Gateway not only captured the title for best desktop, it also got the nod for best service and support and ranked in the top five for portables, notebooks, most promising newcomer and best mail-order firm."

– *PC World*, 1992 Readers' Choice Awards

"I wish I could be sure I'm buying from a PC company that will provide excellent service and support – a company that will be around for me." Your wish is our command!

Twice in 1992, Gateway was honored for outstanding service. *PC World* readers ranked Gateway number one in service and support. And *PC Magazine* readers gave Gateway the best overall scores in the 1992 Service and Reliability Survey.

Just as important is our strength as a company. Warranties and assurances of lifetime technical support don't mean anything unless a company survives to honor them, which is a serious consideration in the shifting sands of today's PC marketplace.

Gateway is among the few financially robust companies in the industry. Our 1992 revenues exceeded $1 billion and our earnings are among the strongest in the industry. The company is virtually debt-free. At a time when other companies have been forced to lay off employees, we added 300 people to our staff. You now have 1,800 friends in the business. Rest assured Gateway is your oasis that will never leave you high and dry. We'll be here for you!

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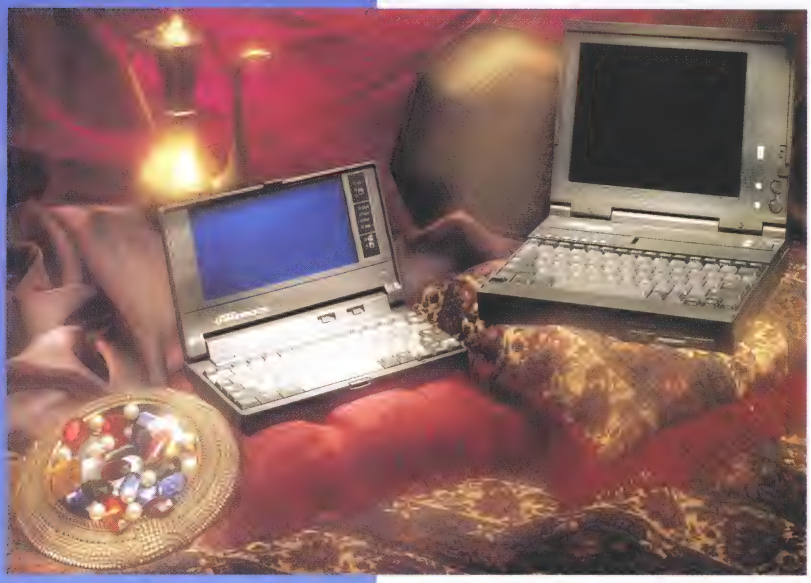
For The Nomad In You.

"I wish I could find the combination of features I need in a portable PC - at the right price." Your wish is our command!

No matter what you need in a portable, you'll find it in one of our Nomad models or in the Gateway HandBook.™ Gateway customers selected Nomads as the winners in 386 and 486 notebook categories of *Computer Shopper's* 1992 Best Buy Awards.



"There are faster laptops, there are cheaper laptops, there are color laptops, but there is no better laptop ... Weighing in at only 5.6 pounds, the Nomad combines the powerful punch of a 25MHz i486DX with a working battery life of more than six hours. At long last, we have a laptop that can really go the distance when there's no power outlet in sight."

– *Computer Shopper*, 1992 Readers' Best Buy Awards

The Gateway 2000 HandBook is an enchanting, one-of-a-kind, real PC in miniature form! The HandBook, recognized by *Popular Science* magazine as one of the "Best of What's New" products of 1992, also received *BYTE* magazine's Award of Distinction.

PC Computing describes the HandBook as "an engineering marvel." *PC Week* agrees. "Gateway's HandBook is just about as small as a fully functional portable can be. Because the HandBook is powerful enough for most of my needs and fits comfortably in my briefcase, I now leave the computer bag at home."

Our Caravan Of Extras.

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Your every software need is our command. With mini desktop, desktop and tower systems that include "choice of application software," select one of the following applications, all latest versions:

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- Borland Paradox® or dBASE IV®
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- Upgrade to Microsoft Office™ for $175

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Cool Tools for DOS, a diagnostic and utilities package, comes with all Gateway desktop systems and includes:

- QA Plus™ from Diagsoft™
- Central Point® Anti-Virus, RAM Boost, Defrag and Emergency Disk

Microsoft Windows™ for Workgroups

Windows for Workgroups is ideal for e-mail, group scheduling and resource sharing, and includes an Ethernet adapter and software. Plus the hardware and software is factory-installed. You can see Windows for Workgroups running on Gateway systems in any of over 200 Egghead Software® stores in the U.S. Stop by for a demonstration!

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Most Gateway peripherals are sold only with the purchase of a Gateway system. For details on our complete line of components, peripherals and software, call direct to our special add-on components division at ***800-252-3333.***

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- Mini Desktop Case
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- 5.25" & 3.5" Diskette Drives
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- 15" Color CrystalScan 1572FS
- Desktop Case (Tower Upgrade)
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- 15" Color CrystalScan 1572FS
- Desktop Case (Tower Upgrade)
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- 79-Key Keyboard & FieldMouse
- MS-DOS 5.0 and Windows 3.1
- MS Works for Windows 2.0

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Your Basic Humble Parallel Port: A New PC Superhighway

With the constant chat about GUIs and this processor and that bus, you probably don't pay much attention to your parallel port. The same old port has been quietly hanging onto the back of your computer for the past decade.

But of course, nothing on a PC remains unchanged indefinitely, so now it's your parallel port's turn in the spotlight. Starting in spring, this boring little aperture begins to metamorphose into a logical superhighway. Eventually a single super port will send *and* receive huge quantities of data to and from printers, scanners, faxes—even other LAN workstations.

Our story begins many months ago with several different groups looking for ways to boost the pitiful sub-100K/second bandwidth of Your Basic Humble Parallel Port (YBHPP). Lexmark, Intel, and others formed the Network Printer Alliance (NPA) to work on a common specification. Zenith and Xircom (the pocket LAN adapter people) helped ensure the spec would support transferring LAN data as fast as 1.5MB per second. Hewlett-Packard contributed its own bidirectional protocols, which let its new LaserJet 4 transfer data about six times faster than previous LaserJets and send full printer status and control panel information back to the PC.

Fast forward through a series of IEEE committee meetings to unify the different designs, and by summer 1992, we had the Enhanced Parallel Port (EPP). Intel included support for it in the I/O controller of its 386SL processor, which means that about half the notebooks shipping today are already capable of transferring data at least ten times faster than YBHPP.

But EPP committee members recognized that they could do a lot better if everyone could agree on a software handshaking standard. The words *software standard* had barely formed on their lips when Microsoft proffered its Enhanced Capabilities Port (ECP) spec—"Zippy" for short. It defines tomorrow's parallel port as a true superhighway supporting bidirectional data transfer speeds as high as 10MB per second. Zippy wasn't the only proposal on the table. But after Microsoft drafted Hewlett-Packard onto its team, the specification was adopted by all combatants before so much as pocket change could be spilled.

Actually, Microsoft had been working on speeding up TrueType printing for some time—the need for which is obvious to anyone who has ever tried printing a *Windows* file. In truth, Microsoft's spec was the most compelling, supporting Direct Memory Access (DMA)–controlled data transfer that's equally robust in both directions. Scanners could feed the PC data as fast as the PC can blast data to printers and other output devices.

You can glimpse Microsoft's vision of the future in its new Windows Printing System (WPS) cartridge for LaserJet IIs and IIIs. Using the limited bidirectionality inherent in today's serial and parallel ports, WPS demonstrates the kind of sophisticated graphical and audio printer feedback that should be common later this year. (Imagine your PC speaker squawking "the printer's jammed!")

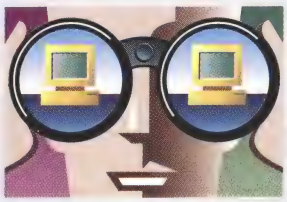
The silicon for Zippy ports should be available from Chips and Technologies and National Semiconductor this spring. Conservative estimates put initial Zippy throughput in the 2MB-to-5MB-per-second range—able to support multiple peripherals operating sequentially on the same parallel port.

Of course, new capabilities always demand more resources. Some note that without a parallel-port bottleneck, *Windows* could partially use the LaserJet 4's RISC processor and 6MB of memory much the way WPS controls the LaserJet II. Imagine offloading a huge spreadsheet calculation to your desktop printer. Other printers could become cheap engines pumping out print files, while your PC does the rasterizing and page description.

Either method will be much faster, let you control external peripherals from your PC, and configure anything on a parallel port in a flash. YBHPP is about to become the gateway to a much wider computing horizon.

By Mike Hogan

WHAT TO WATCH



A $79 Connectivity Kit from BSE of Flagstaff, Arizona, lets you link the nonstandard serial port of Hewlett-Packard's 95LX palmtop to the parallel ports of ordinary printers or other add-on devices like BSE's 130MB portable Flashdrive . . . . Tell your computer to launch *Windows* apps or even read you E-mail over the telephone using the Omnivox soundboard with headset, starting to ship now for about $200 from Kingston Technology of Fountain Valley, California . . . . Run your printer, scanner, and up to two other peripherals from a single parallel port with the F/Mux multiplexor from Lancaster, California's Far-Point Communications. The $199 external adapter transfers data in both directions at a fast 1.25MB/second . . . . CompuServe subscribers can call 800/848-8199 to order the new $25 *CompuServe Interface Manager for Windows*, enabling them to browse the service off line and task-switch among its different utilities while on line; a $50 new-member kit with signup module arrives in March . . . . Questions? Call 310/312-8041.

PHOTO: MICHAEL LLEWELLYN; ILLUSTRATION: JEFF BERLIN

Why people who k aren't going anyw

Over 18 million people use some version of Lotus® 1-2-3® every day. They depend on it. They trust it. They know it. Which is why, if they're moving from DOS to Windows,™ they're moving to 1-2-3 for Windows...for some very good reasons.

They know that *only* 1-2-3 is fully compatible with 1-2-3.

Only 1-2-3 for Windows is able to read and execute every 1-2-3 for DOS file, style and macro. Which means you can preserve your full investment in 1-2-3 for DOS files when you move to 1-2-3 for Windows. And only 1-2-3 for Windows—with its built-in Classic® Menu—lets you use all your familiar 1-2-3 commands.

They know that 1-2-3 offers the *best* 3D technology.

Only 1-2-3's 3D technology gives you easy access to 256 worksheets and lets you build 3D formulas just like you do in 2D. Which ultimately makes consolidating, comparing and analyzing data much simpler. In comparison, Excel's Workbook™ is a limited imitation of true 3D. And while working in Group Mode in Borland's® Quattro® Pro for Windows, simply cutting a range of data in one sheet unfortunately means you'll delete the data on every sheet. And what's worse, you can't undo it. All of which means if the analytical power of 3D technology is important to you, 1-2-3 is still the best choice you can make.

They know that 1-2-3 for Windows now includes the *most asked-for* enhancements.

The new release of 1-2-3 for Windows Release 1.1 includes a number of performance enhancements. For example, it's now the fastest Windows spreadsheet for printing on PostScript® printers. And it's also the fastest to launch. We've also added over 25 innovative new features, usability enhancements and GUI development tools. The result? 1-2-3 for Windows is now more powerful and easier to use than ever before.

They know that 1-2-3 for Windows offers *unmatched* database capabilities.

It's true. If you're a spreadsheet user who needs to access external databases, 1-2-3 for Windows remains unmatched—particularly if you need relational capabilities. In fact, *Corporate Computing* (August 1992) recently wrote that *"for the experienced 1-2-3 database user, 1-2-3*

*In Canada call **1-800-GO-LOTUS.** ©1992 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, 1-2-3 and DataLens are registered trad
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now spreadsheets here without 1-2-3.

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Not only do more people prefer our product, but according to the ComputerWorld Spreadsheet Brand Preference Study, more people prefer our company. And even more recently, the Information Technology Association of America announced that Lotus has been awarded its prestigious Quality Award recognizing outstanding customer service and customer satisfaction.

So if you're staying in DOS or moving to Windows or still trying to decide, remember one thing. That people who know spreadsheets are staying with 1-2-3. Call us today for your free demo disk at **1-800-TRADEUP, ext. 7352*** or visit your Lotus Authorized Reseller.

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NEW DELL PCs SPEED

These 486 systems offer incredibly easy access to system components and a path to Pentium technology.

THE MODULAR DELL 466/L makes upgrades easy: Turn two thumbscrews to remove the cover; the hard drive and expansion card cage are held in by one screw apiece and lift out easily.

TEST DRIVE Who says higher performance costs more? Dell Computer has revamped its 486 line with 18 speedy desktop and tower PCs. Each has a *Windows*-accelerating, local bus video design that delivers at least twice the graphics performance of Dell's previous 486 PCs, the company says, but costs no more. As if that weren't enough, each new Dell 486 is upgradable to Intel's Pentium-based OverDrive processor, offering an easy path to even higher performance.

Dell's new 486 family begins with the 486/L series of five compact desktop PCs. They all feature an innovative modular design guaranteed to take the fear and loathing out of upgrading components such as RAM, disk drives, and processors. Even replacing the motherboard is a snap. Also new are five midsize 486/M models, five 486/ME's (the EISA version of the 486/M), and three 486/T models, which are floor-standing, ISA bus towers. As with all Dell systems, you pick the processor and peripherals best suited to your needs, so prices vary according to configuration. However, all combinations are competitively priced: For example, a 425s/L with a 25-MHz 486SX processor, an 80MB hard drive, and an 800-by-600-pixel VGA monitor costs $1499.

Graphics on the Motherboard

Dell's new line shares a proprietary local bus video subsystem that greatly speeds up *Windows* applications and other graphics-intensive programs, such as *AutoCAD*. Rather than adopt a standardized local bus approach that uses a dedicated video slot on

Edited by Russell Glitman

GRAPHICS

the I/O bus and an add-in video card, such as the VESA bus used by the Gateway 2000, Dell soldered its graphics subsystem right on the motherboard. Built around the S3 86C805 graphics chip that powers many *Windows* accelerator boards, this video subsystem transfers graphical data to the processor at motherboard speeds. (In our *Windows 3.1* benchmark suite, the 66-MHz Dell 466/L ran about 10 percent faster overall than the average 486DX2-66 tested in recent *PC World* system reviews.)

Dell has also boosted overall system performance with faster chip sets. For starters, the new units boast an improved memory architecture that uses faster SIMMs (70 nanosecond versus 80 nanosecond in previous 486s). In addition, an optional 128K external RAM cache that was previously available only for Dell's EISA systems is offered with these machines.

Ready for OverDrive

Each of Dell's new 486s includes a socket for Intel's 238-pin OverDrive processor, which is based on the chip maker's next-generation Pentium processor. With four extra rows of pinholes for the OverDrive chip, this socket gives you an upgrade path that extends beyond the 486. The Pentium-based OverDrive should be available in early 1994.

These systems include several thoughtful touches that make computing a lot easier. For example, each of the ISA models has a set of diagnostic programs stored in flash RAM. Rather than sift through your drawer for a long-lost diagnostic disk if your PC won't boot, simply click the reset button twice and check the status of the entire system or of individual components like disk drives. (Dell was not able to squeeze the diagnostics into flash RAM on the EISA systems.) Also new is a front-panel reset button and an LED power-on indicator, as well as support for 2.88MB floppy drives. (However, a 2.88MB drive will set you back an extra $30.)

Modularity of the 486/L

The 486/L models are the easiest systems to upgrade we've ever seen. A compact desktop PC with room for only three ISA expansion cards, the series' modular design includes a variety of components that plug into place, making upgrades and maintenance literally a snap.

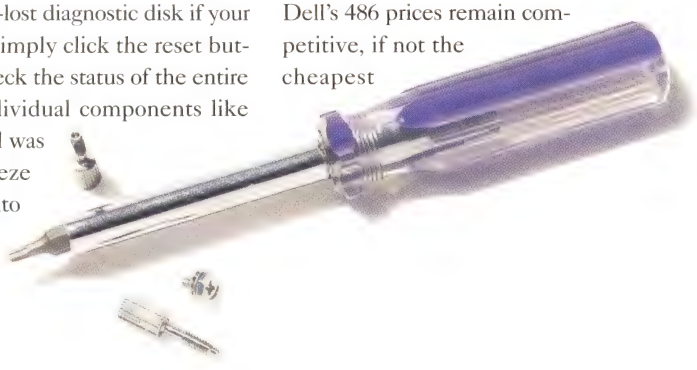
You need only turn two thumbscrews to lift off the system cover. Need to upgrade the processor or add RAM? First remove the single screw that attaches Dell's expansion card cage to the case, and lift the cage: You don't have to remove your add-in cards or their cables first because they'll stay attached to the cage. Turn another screw to release the hard drive, which lifts easily out of the case. The motherboard and floppy drives also snap out easily—no screwdriver is required.

The ingeniousness of the 486/L series begs the question: Why didn't Dell design all of its new 486 systems this way?

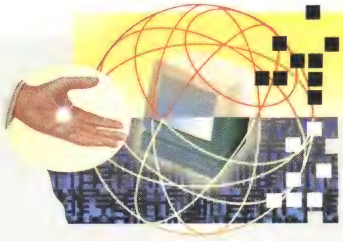
According to company officials, the 486/L is the testing ground for the modular design: A favorable customer response could lead to more systems built this way.

The Price Is Right

In today's cutthroat PC market, the worst thing a vendor can do is raise prices. Thus Dell's 486 prices remain competitive, if not the cheapest



PHOTOS: JOHN GREENLEIGH



News Monitor

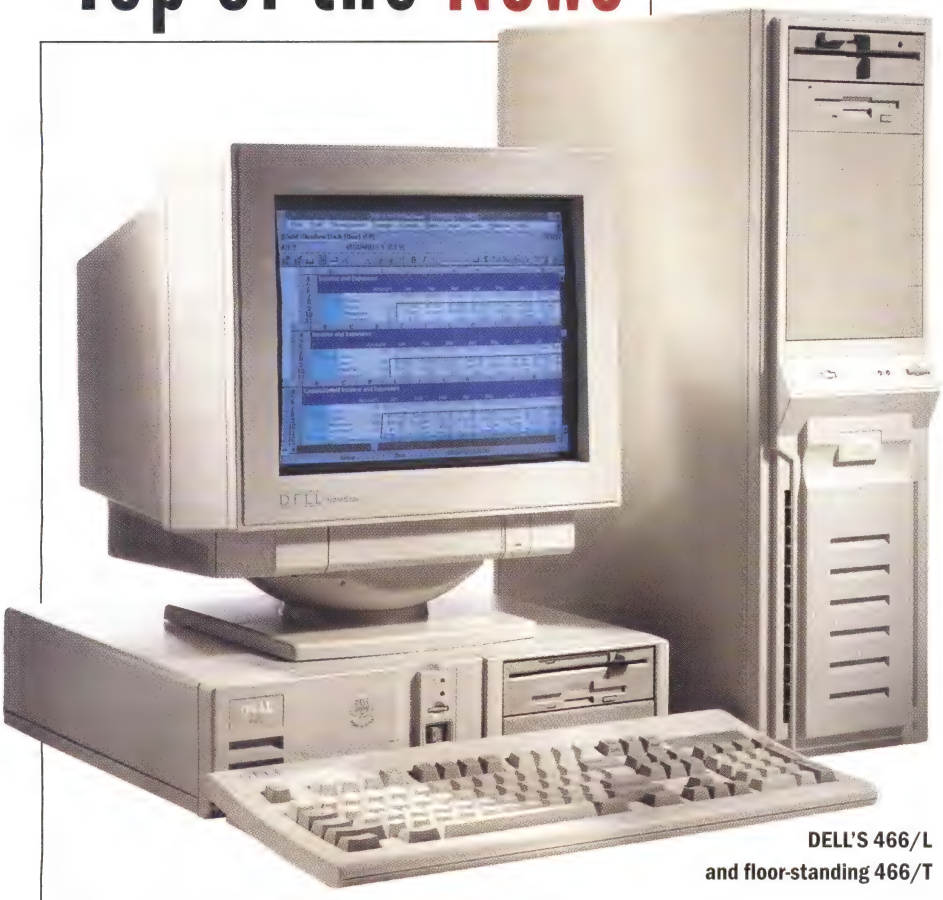
THE SYSTEM IS IN THE MAIL: If you ordered an IBM PS/ValuePoint in early December, you're not the only one still waiting for your system. While at the time IBM told customers the wait for ValuePoints would be four to six weeks, industry watchers were less optimistic. And the situation may not improve. Analysts say PCs ordered in early 1993 from IBM and other large vendors may not be received until the spring. Orders for low-end systems aren't slowing down, and component shortages are worsening, says JoeAnn Stahel, a senior industry analyst at InfoCorp. Stahel says vendors will be stuck as Intel is pressed for 486 chips. Meanwhile, Compaq is still battling its backlog, which it now says will end in March. As of December, Dell customers were also waiting two to three weeks for some systems.

COMPAQ DIRECT: Compaq Computer now sells its desktop and notebook PCs through five national mail-order vendors. The move expands Compaq's distribution to reach more customers in the home and small-business markets. The vendors are Granite Computer Products, Insight Distribution Network, PC Connection, PCs Compleat, and USA Flex. Compaq PCs sold directly include ProLinea and Deskpro 386 desktops and Contura, LTE Lite/25C, and LTE 386s/20 notes.

NOVELL'S PERSONAL NETWARE: Mid-1993 should bring Novell's response to Microsoft's *Windows for Workgroups*. Novell plans to integrate its *NetWare Lite* peer-to-peer networking software

(continued on page 65)

MICK WIGGINS



DELL'S 466/L and floor-standing 466/T

Continued from page 63

around. The 433/L model with a 33-MHz 486DX processor, 8MB of RAM, 1MB of video DRAM, one floppy drive, a 230MB hard drive, and a 14-inch, noninterlaced 1024-by-768 super-VGA monitor costs $2499. A similarly configured 433/M, Dell's midsize 486 desktop with six ISA slots, costs $2749.

For power users, Dell's 466/ME, a midsize EISA desktop with six expansion slots, costs $3449. This system has a 66-MHz 486DX2 processor, 8MB of RAM, 1MB of video DRAM, one floppy drive, a 230MB hard drive, and a 14-inch, noninterlaced 1024-by-768 monitor. A similarly configured 466/T, Dell's floor-standing tower model with eight ISA slots, costs $3399.

Meanwhile, at the bargain end of the PC spectrum, Dell, Compaq, IBM, and other manufacturers continue to do the pricing limbo. Dell recently reduced prices on its low-end Dimension series, a collection of ten 386 and 486 systems that cost less than the models in Dell's new lineup

Apple Offers 600-dpi Cross-Platform Printing

TEST DRIVE

Finding a laser printer that works with both Macs and PCs just got cheaper and easier. Apple has announced two PC-compatible PostScript printers for under $3000: the LaserWriter Pro 630 and Pro 600. Both boast two ports for PCs and improved resolution, gray-scale, and paper-handling features. For small to medium-size work groups with mixed platforms and demanding graphics needs, these products warrant serious consideration.

Both the $2999 LaserWriter Pro 630 and the $2399 LaserWriter Pro 600 meet the new office printer performance standards set by Hewlett-Packard's LaserJet 4 printers: print speed up to 8 pages per minute at resolutions up to 600 dpi. The LaserWriters include PostScript Level 2, the 64-font Apple Font Library with 35 printer-resident PostScript Type 1 fonts, support for TrueType fonts, and built-in parallel, serial, and LocalTalk ports for easy connectivity in mixed environments. Both Apple printers include a 100-page and a 250-page paper tray, with an optional 500-page tray for $399 and a 75-envelope feeder for $399. The 630 adds two SCSI ports (one internal, one external) for attaching hard drives to store additional fonts, an EtherTalk port for high-performance Mac networking, and 8MB of RAM—4MB more than the 600—for demanding graphics applications.

We tested a preproduction version of the 630, which is geared toward graphics professionals. It offers two advanced printing modes: PhotoGrade for improved gray-scale output and 600-dpi resolution for smoother, better-looking type. (A $269 4MB memory upgrade lets the LaserWriter 600 print in these two modes; without it, the 600 prints at 300 dpi only.)

The current version of PhotoGrade offers 91 levels of gray, up from 67 levels available in the version included in Apple's older LaserWriter IIg and IIf. The only hitch is PhotoGrade's 300-dpi resolution limit—using the feature when you print documents that include text and photos means sacrificing a little quality in the text and line drawings, which look better at 600 dpi.

Apple LaserWriter Pro 630, 600

Key Features

- Attach PCs and Macs
- TrueType fonts and PostScript Level 2
- Automatic paper tray switching

Availability

January

Pricing

LaserWriter Pro 630 $2999, 600 $2399

Apple Computer Corp.
800/776-2333, 408/996-1010
Reader service no. 736

but lack many of the advanced features of these systems, such as local bus video and the capability to be upgraded to OverDrive for DX2.

Of course, Dell's new lineup comes with the company's respected service and support, including toll-free technical support and on-site service. Once again, Dell offers systems with a mix of innovative technology and competitive pricing that makes them serious contenders.

—Jeff Bertolucci

Dell 486s

Four new 486 series with local bus video.

Availability

Immediate

Pricing

$1499 to $4989

Dell Computer Corp.
800/289-3355, 512/338-4400
Reader service no. 737

486/L

Key Features

- Modular design for easy upgrades
- Three 16-bit ISA expansion slots
- Diagnostics in flash RAM

486/M

Key Features

- Midsize ISA desktop
- Six 16-bit expansion slots
- Diagnostics in flash RAM

486/ME

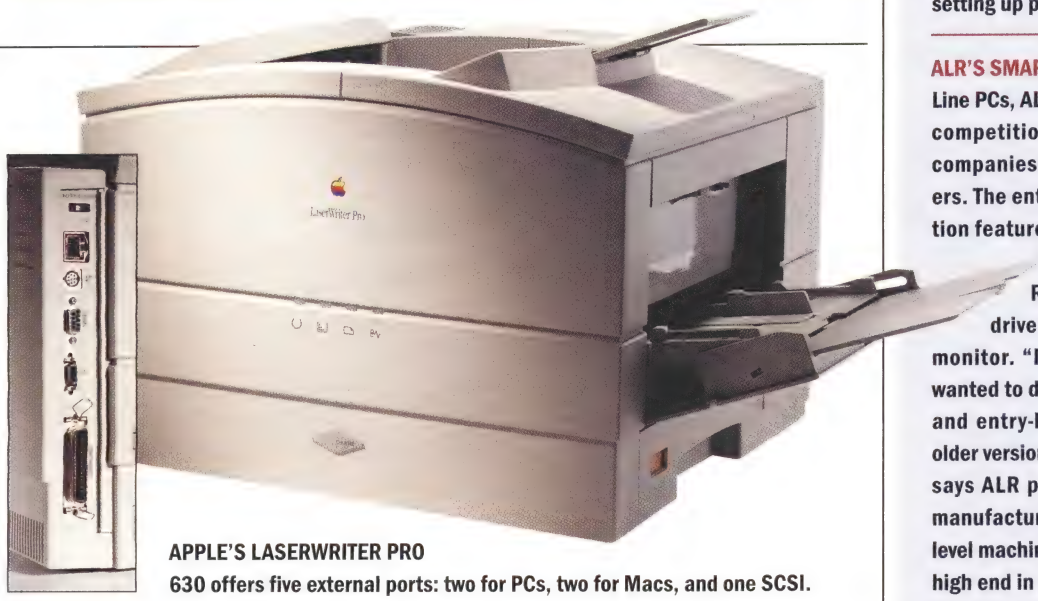
Key Features

- Midsize EISA desktop
- Four 32-bit expansion slots
- Two 16-bit slots

486/T

Key Features

- Floor-standing ISA tower
- Eight 16-bit expansion slots
- Six external, half-height drive bays

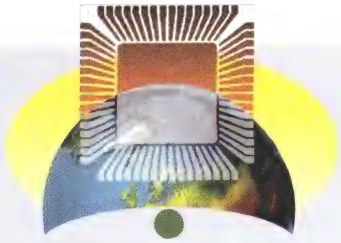


APPLE'S LASERWRITER PRO 630 offers five external ports: two for PCs, two for Macs, and one SCSI.

We printed gray-scale scanned images from *Windows 3.1* applications at 300 dpi using PhotoGrade and at 600 by 600 dpi without PhotoGrade. Images printed about 15 percent faster using PhotoGrade than at 600 dpi, but the PhotoGrade versions didn't reproduce the originals as faithfully.

The LaserWriter Pros offer conveniences you've come to expect, including a small footprint of about 17 by 17 inches. They also feature automatic tray switching, and the toner cartridge is accessible and snaps in and out for easy replacement. All in all, Apple's new LaserWriter Pros offer solid value for offices with demanding graphics needs that want to save money by sharing a laser printer between Macs and PCs.

—Randy Ross



News Monitor

(continued from page 63)

with the DR-DOS operating system, add additional features like remote access, and call it *Personal NetWare*. *Personal NetWare* will include dial-in access and remote printing, as well as DR- DOS's memory management, password protection, disk compression, and other utilities. Novell plans to market *Personal NetWare* three ways: in conjunction with NetWare (for creating departmental work groups for file and printer sharing), bundled with PCs, and as a retail product aimed at NetWare users and at small businesses setting up peer-to-peer networks.

ALR'S SMARTLINE: With its new SmartLine PCs, ALR has made its move in the competition between big-name PC companies for small-budget customers. The entry-level SmartLine collection features a 33-MHz 386SX-based Flyer SC with 2MB of RAM and an 80MB hard drive; it starts at $799 without monitor. "In the past, people really wanted to design high-end machines—and entry-level machines were just older versions of the high-end models," says ALR president Gene Lu. "Now, manufacturers are focusing on entry-level machines, and they're rivaling the high end in quality and value." The 33-MHz 386-based SmartLines can be upgraded with 25-MHz 486SX processors and up to 16MB of RAM.

BORN IN THE U.S.A.: Bruce Springsteen would likely approve the efforts of a Lexmark-led consortium to build on U.S. soil more of the 2.5 million

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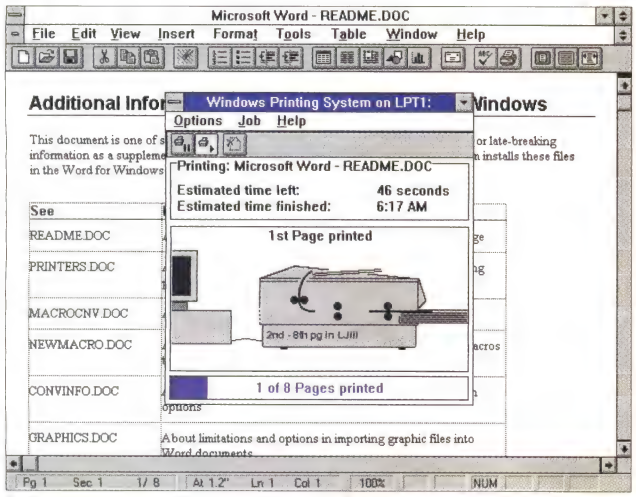
PHOTOS: JOHN GREENLEIGH; ILLUSTRATION: MICK WIGGINS

Microsoft Speeds Windows Printing



MICROSOFT'S PRINTING SYSTEM helps you track your print job.

TEST DRIVE Everyone, but particularly *Windows* users, needs to print documents faster. Microsoft has come up with a solution for owners of HP LaserJets, even if they're short on time, technical expertise, and cash. The $199 Windows Printing System boosts *Windows* printing speed as much as 5 times and offers one of the easiest installations we've seen for a printer enhancement product. Moreover, the product works with a wide range of HP products, including Series II, IIP, IIP+, IID, III, IIIP, and IIID printers.

The Windows Printing System consists of a plug-in cartridge and software that includes a driver and 79 fonts. The combination, which essentially installs parts of *Windows 3.1* on your printer, puts your PC and printer on speaking terms. As a result, printing is faster because instructions don't have to be translated from the *Windows* command language to the printer command language. In addition, the non-networked printer can now send messages, such as 'paper out' or 'printing finished', back to the PC.

THE WINDOWS PRINTING SYSTEM cartridge is easy to install.

JOHN GREENLEIGH

Effortless Installation

Installing the Windows Printing System hardware is a no-brainer: Just plug the cartridge into the font slot on the front of the printer. That's a lot easier than installing many other printer accelerator products, which typically combine an ISA expansion card with a font slot cartridge or a video interface module that plugs into the back of the printer.

Installing Windows Printing System software is also simple. You just issue the File Run command in Program Manager and follow the instructions. Other products require you to add drivers manually to the Printer dialog box in the *Windows* Control Panel and then adjust the Setup menu.

Microsoft claims the Windows Printing System can increase standard printing speed up to 5 times, with the most dramatic improvements for printers that have not been upgraded with memory and are used chiefly to print long, complex documents. Users printing PostScript documents should witness even more dramatic speed benefits—improvements of up to 10 times can be obtained, Microsoft claims. But even for printers packed with additional RAM, speed enhancements can be significant. On a LaserJet Series II crammed with 2.5MB of RAM, a one-page newsletter printed about 2.5 times as fast as it did before we installed the Windows Printing System. A complex gray-scale graphic printed twice as fast.

Easier Printing

For printers connected directly to your PC, this product provides visual and audio feedback on the progress of your print job. As an on-screen graphic depicts the document traveling through the printer, a computerized voice tells you what is happening over your PC's speaker and alerts you to problems, such as a jam or lack of paper. You can monitor the printer from your desk or anywhere within earshot of your PC—no more running to the printer to check on the progress of your job.

The on-screen graphic has a menu of common printing options, such as halftoning and collating, that saves time by providing a uniform print menu for your apps.

The Printing System, including fonts, requires about 7.5MB of hard disk space.

—Randy Ross

Microsoft Windows Printing System

Key Features

- **Two to five times faster printing**
- **Easy to install and use**
- **Provides feedback on printing progress**

Availability

Immediate

Pricing

$199

Microsoft Corp.
800-426-9400
Reader service no. 738

Intel Reveals Pentium Details

INTEL'S RON CURRY: Processing in the future with Pentium.

ROBERT HOLMGREN

Like most technobabies, it emerged late from the delivery room, but Intel's next-generation Pentium processor should appear in systems from every major PC vendor by March. Early glimpses confirm that it will be one very hot chip.

The 66-MHz Pentium zips along at over 100 MIPS—more than twice the horsepower of a 486DX-33. It's ready for the heaviest server duty and is the equal of many RISC competitors, boasts Intel product manager Ron Curry. Yet, with Pentium systems likely to debut in the $4000-to-$6000 range, they'll make sense for *Windows* power users as well as those who tangle with large spreadsheets and audio/video.

The chip gets its punch from integer unit, cache, bus, and floating-point enhancements—a combination that makes it operate like a pair of 486s. Its 64-bit doorway is twice as wide as that of Intel's 486 generation, and program code and data have their own dedicated 8K caches. Add an ability to predict what should be in the cache, and you have a chip that typically executes more than one instruction per clock cycle.

The Pentium is even better at number crunching. Its floating-point unit is beefed up with more transistors; dedicated multiply, add, and divide units; and other enhancements that let it complete floating-point calculations in one-tenth the time a 486DX-33 takes.

Software will need to be recompiled to take full advantage of Pentium innovations, but even 16-bit applications will run twice as fast as they do on a 486DX2-66, says Curry.

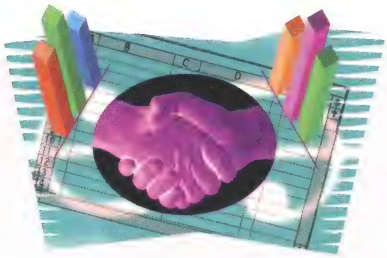
Welcome to the era when all processors wear heat sinks as top hats. Precisely how many watts various implementations of the Pentium will draw and how hot they will get is an open question. The heat-sink-bedecked 486DX2-66 draws about 3 watts, and the Pentium has almost three times as many transistors (3.1 million). But typical usage is probably well below 9 watts, says Curry, because different elements can be powered down when not in use. Pentium can also power down other PC subsystems for a considerable savings in electricity.

Similarly, PC makers' creative use of heat sinks in combination with air channeled over critical areas should eliminate heat as a problem, maintains Curry.

IBM, Compaq, Dell, NCR, NEC, and AST all showed Pentium implementations in November and expect to have Pentium-oriented enhancements ready the day Intel introduces the chip.

Don't expect Pentium shipments to overtake those of 486s this year. Do expect Pentium clones in 1993. For now, Pentium makes the score: advantage, Intel.

—Mike Hogan



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notebooks and subnotebooks expected to be sold here this year. Flag waving aside, the team of Lexmark, AMD, Cyrix, Western Digital, and an IBM manufacturing group figures it can beat the Japanese and Taiwanese in delivering to U.S. relabelers portables with features such as customizable CPUs, keyboard innovations, and rechargeable batteries. A floppyless, 3.5-pound "minibook" with eight hours of battery life and up to 170MB of hard drive should appear under various labels for around $2000 this quarter. The major exception to the "Made in U.S.A." label will be the machines' backlit monochrome and color LCDs from Sharp.

WHAT HATH DELL WROUGHT? Not long ago, most PC makers followed the leaders—Compaq and IBM—in telling you to take repair problems to a dealer. Now, no one fights harder than the leaders to lend you a hand. Compaq has slapped a three-year warranty on all its desktops and notebooks, including a year (three years for servers) of second-business-day, on-site service. IBM HelpWare delivers three years of on-site service faster—next business day—but only for PS/2s, not notebooks, ValuePoints, or PS/1s. The new CompaqCare offers a lifetime of 24-hour, toll-free technical support seven days a week. Dell, which got the service-and-support ball rolling, has a one-year, next-day on-site package for its high-end line, but a less comprehensive one for its budget PCs.

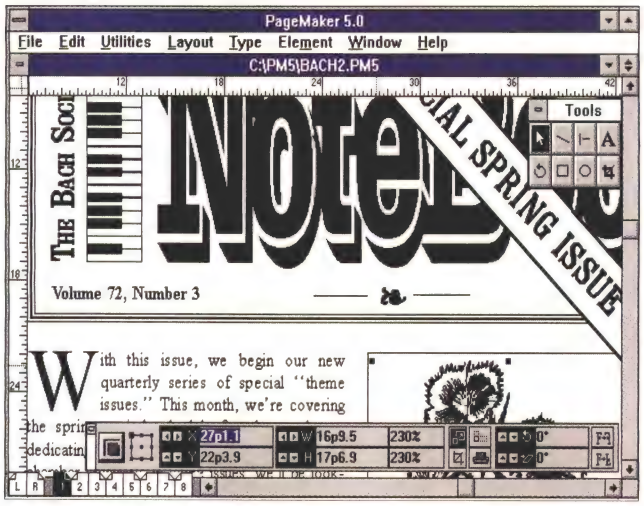
—Jeff Bertolucci, Mike Hogan, Laurianne McLaughlin

PageMaker Much Improved

TEST DRIVE *PageMaker 5.0 for Windows* offers a host of new controls and tools so well implemented and integrated that users upgrading from version 4.*x* will probably spend more time installing the program than mastering its new offerings.

First-timers will find a top-of-the-line page makeup program that's easier to use than any of its competitors—and easier to use than its previous versions. And its documentation is probably the most lucid and best organized of any program of comparable complexity.

The major change in the program is operational: The addition of a "control palette" (similar to the one used by its Macintosh rival *QuarkXPress,* which was recently released in a *Windows* version) eliminates a lot of forays through menus and dialog boxes. The palette functions are context-sensitive, so when you're working with text, for instance, you can adjust text frame size and set paragraph specs. If you're working with graphics, the palette allows you to adjust the position, height and width, rotation, cropping, skew, and scale of an image.



PAGEMAKER 5.0's new context-sensitive control palette puts dozens of tools at your fingertips, eliminating time-wasting menu safaris.

PageMaker 5.0 does these things with great precision, guaranteeing accuracy to 1/20 of a point. That translates into single-dot precision at a resolution of 1440 dots per inch (*PC World* is typeset at 1270 dpi).

Most of *5.0*'s other new features are of the "it's about time" variety. They include baseline-to-baseline leading, custom rule weights (for dashed and dotted lines, too), automatic color separations (simply an option in the Print dialog box), rotations and skews in any increment for both text and graphics, step-and-repeat copying, image control for halftones, and the ability to nudge items in minute increments to align or position them precisely.

A number of add-on modules expand *PageMaker's* capabilities, including tools for editing kern tables, creating PostScript Multiple Masters font variations, and writing batch file "scripts" to execute a series of operations within *PageMaker.*

A unique *PageMaker 5.0* offering is an implementation of the Panose font matching system. This system indexes the design characteristics of most major typefaces, enabling appropriate substitutions for unavailable fonts. A *PageMaker* document, then, could be circulated electronically and retain its format regardless of whether the receiver has the fonts used in the original document.

By filling gaps in its tool kit and emphasizing productivity and precision operation, *PageMaker 5.0* consolidates its previous strengths and covers its old weaknesses in an efficient, easy-to-use bundle.

—James Felici

PageMaker 5.0 for Windows

WINDOWS Highly integrated features make the latest version easy to use.

Key Features

- **Context-sensitive control palettes**
- **Guaranteed accuracy to 1/20 point**
- **Panose font matching system retains format for non-PageMaker users**

Availability
February

Pricing
$895

Aldus Corp.
206/628-2320
Reader service no. 735

PCMCIA, ExCA: Acronym Overload?

Just when you figured out what PCMCIA stands for (hint: Personal Computer Memory Card International Association), along comes ExCA, a specification created by Intel to ensure that PCMCIA cards will work in any PCMCIA slot in an Intel-based PC.

Thus far, most PCMCIA card manufacturers have chosen to support ExCA, or Exchangeable Card Architecture.

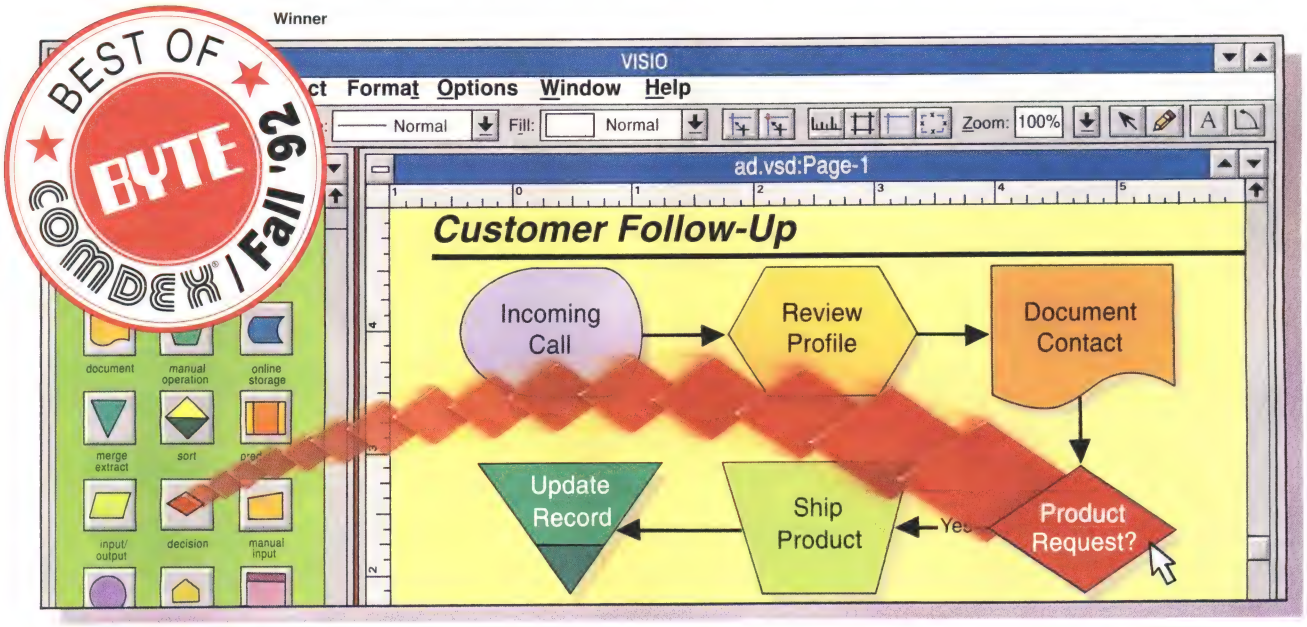
However, some portable PCs with PCMCIA slots will use non-Intel CPUs and aren't covered by the ExCA spec. Consequently, some PCMCIA card vendors believe a one-card-fits-all standard is the best approach.

Will end users get lost in the acronym jungle? "I think that's a relevant concern, and we've been doing as much as we can to make sure that isn't the case," says Jim Weisenstein, Intel's FlashCard Systems Group director and president of the organization PCMCIA.

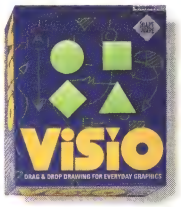
PCMCIA PRESIDENT JIM WEISENSTEIN

MARC LONGWOOD

VISIO IS FOR ANYONE WHO THINKS DRAWING IS A DRAG.

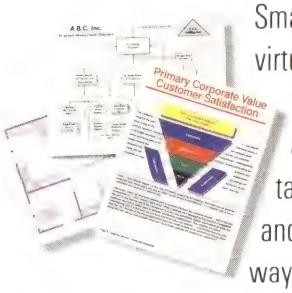


Now you don't have to be a graphic artist or draftsman to create impactful business and technical drawings. Because *if you can drag and drop, you can draw.* It's easy with Visio™, Shapeware's™ new drawing program for Microsoft® Windows™ 3.1 users.



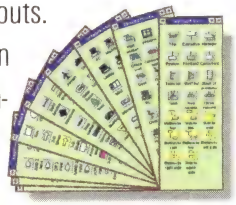
By just clicking your mouse, Visio lets you drag and drop shapes, change their size or color, connect them automatically and type in text. Drag. Drop. Done! It's that easy.

Only Visio gives you more than 300 drag and drop SmartShapes™ to help you create virtually any drawing or diagram. Unlike clip art, SmartShapes are "intelligent." They can take on different forms, colors, and proportions and behave the way you expect. And with Visio's simplified tool set, you can easily create your own customized shapes using a single pencil tool.



For easy access, SmartShapes appear right on your screen on job-related "stencils." Each stencil features all the shapes you could possibly need for your specific drawing.

There's a Visio stencil for flowcharts. One for space plans. Organizational charts. Business models. Marketing diagrams. Gantt charts. Computer network layouts. Engineering schematics. And direction maps. Visio includes 15 stencils, standard. And you can also get additional stencils for more specific jobs.



So if you need to concentrate on *what* you want to draw, not *how* to draw it, you need new Visio from Shapeware. The only Windows software that lets you draw from more than your imagination.

SPECIAL CHARTER OFFER.

Buy Visio now for just $249. And if you order and register by April 30, 1993, you'll also receive: ■ An additional Visio stencil set of your choice ■ A free issue of *Windows*, *Windows Sources*, **and** *Windows User* magazines ■ Free technical phone support for 90 days ■ A 60-day money-back guarantee. To order Visio, or for the names of authorized Visio resellers near you, call toll-free:

1-800-446-3335, ext.FB1

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Circle 196 on reader service card

Fleet of VL-Bus Boards Boost Graphics Speed

The introduction of a wide assortment of local bus boards offers users a rich selection of solutions for dramatically improving graphics performance.

"Local bus" refers to bus designs that run at the system's clock speed instead of the 8.33-MHz speed of standard ISA buses. Peripherals such as graphics adapters, disk controllers, and network cards can send and receive data much faster on a local bus than on a traditional bus, and that should boost system performance.

To take advantage of the local bus, both the system and the peripheral have to be designed to the same specification—putting a standard ISA card in a local bus slot won't improve performance at all. Since many board makers use the same graphics accelerator chips, the quality of their drivers will be a key differentiator.

To make local bus cards and systems compatible, manufacturers have to agree on how the local bus will work—how signals along the bus are timed, which kinds of data are carried on which wires, and so on. There are currently several competing designs.

First, some system vendors have proprietary local buses. Most are motherboard, video-only solutions that don't offer a slot. Second, Intel is promoting its local bus standard, called PCI (Peripheral Component Interconnect). But that standard isn't fully defined, so there are currently no PCI products.

The one standard local bus design with products is the

Video Electronics Standards Association's, the VESA local bus ("VL-bus" for short). The VL-bus handles 32 bits of data at a time, so it's faster and wider than the standard ISA bus. As system vendors rolled out VL-bus PCs, board makers followed with VL add-ins, usually video controllers.

Virtually every major video board maker has announced a VL-bus product. ATI Technologies was one of the first, followed by Actix Systems, Artist Graphics, Cardinal Technologies, Diamond Computer Systems, Genoa Systems, Hercules Computer Technology, Matrox Electronics Systems, NDI, Number Nine Computer, Orchid Technology, STB, Video Seven, and VidTech Microsystems.

All these products are based on graphics accelerator chips optimized for graphical user interfaces like *Windows* (they handle the graphics functions most commonly used by GUIs, relieving the CPU of the job). But drivers are the key to optimum performance.

When *PC World* first looked at a VL-bus system, specifically a Gateway DX2-66 using ATI's Graphics Ultra Pro board, we were unimpressed. But when we retested the system with revised drivers, performance improved dramatically; the system became one of the fastest we've ever tested.

None of these boards will do you any good without a VL-bus PC. Vendors include Austin Computer Systems, DFI, Gateway 2000, Hyundai Electronics, Northgate Computer Systems, and Zeos.

Should you invest in the VL-bus now? There is no consensus, and some observers believe PCI is a better bet for the long run. But if you want the fastest graphics you can find today, the VL-bus looks like it'll give you a good ride.

—Dan Miller

Board Mania: VL-Bus Add-Ins Proliferate

Company	Product	List price[1]	Processor	Memory[2]	Refresh rate (Hz)[3]
Actix Systems	Graphics Engine 32VL	$249	S3 805	1/2MB DRAM	72
	Graphics Engine 32VL Plus	$269	S3 805	1/2MB DRAM	72
Artist Graphics	WinSprint 900 VL	$795	S3 928	1/2MB VRAM	72
ATI Technologies	Graphics Ultra Pro VLB	n/a[4]	ATI Mach 32	1/2MB VRAM	76
Cardinal Technologies	WarpSpeed	$599	Weitek P9000	1/2MB VRAM	76
Diamond Computer Systems	Stealth 24 VLB	$249	S3 805	1MB DRAM	72
	Stealth Pro VLB	$349	S3 928	1/2MB VRAM	72
	Viper VLB	$549	Weitek P9000	1/2MB VRAM	72
Genoa Systems	Windows VGA 24 VL	$199	Cirrus Logic CL GD5422	1MB DRAM	70
	Windows VGA 24+ VL	$269	S3 805	1MB DRAM	70
Hercules Computer Technology	Graphite VL	$449	IIT AGX015	1/2MB VRAM	80
Matrox Electronics Systems	MGA Impression	$799	MGA	1/2/3MB VRAM	76
NDI	Volante Warp10-LB	$399	S3 805	1/2MB DRAM	70
	Volante Warp24-LB	$499	S3 928	1/2MB VRAM	72
Number Nine Computer	#9GXE	$495	S3 928	1/2/3MB VRAM	100
Orchid Technology	Fahrenheit VA/VLB	$299	S3 805	1/2MB DRAM	70
STB	PowerGraph VL-24	$299	S3 805	1MB DRAM	75
Video Seven	Win.Pro LB	$299	S3 805	1/2MB DRAM	72
VidTech Microsystems	FastMax LB	$299	Avance Logic GUI Ultra	1/2MB DRAM	72
	GraphMax LB	$499	IIT AGX015	1/2MB VRAM	72

[1]1MB version. [2]Most cards support 256 colors at 1024 by 768 resolution. With 2MB, these same boards should be able to display 65,536 colors at the same resolution. [3]Maximum refresh rate at 1024 by 768 resolution, noninterlaced. [4]Not available at press time.

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Answers and help are yours for the downloading on the U.S. Small Business Administration's new bulletin board, SBA On-Line. "This service gives fast, free help," said Patricia Saiki, administrator of the SBA. "It's opening up opportunities for people. Ours is the first truly user-friendly bulletin board from a government agency. And it's a service that never sleeps."

Users can read or download information on SBA programs and resources 24 hours a day. Topics include financial assistance and loans, government contracting opportunities, special programs for women and minorities, and the 30 most-asked small-business questions. Continually updated regional calendars show opportunities in training programs and trade shows. Also, the bulletin board tells you how to call the SBA's group of volunteer retired executives, who give help in their fields.

SBA On-Line really is easy to use. A quick search feature lets you zip through the menu to categories of interest. Its electronic mailboxes let you leave messages and obtain help from a big group: The bulletin board is getting 1000 calls a day, according to Saiki. The SBA On-Line phone numbers are 800/859-4636 for 2400-bps modems, and 800/697-4636 for 9600-bps modems (202/205-7265 or 202/401-9600, respectively, in Washington D.C.). For more information, call 800/827-5722.

PATRICIA SAIKI, administrator of the U.S. Small Business Administration

Cheap Talk: Low-Cost Speech Recognition

Speech recognition is making its way to desktop PCs. A flurry of new, inexpensive products such as Microsoft's $289 Windows Sound System and IBM's $149 Dragon Talk To Plus allow users to control Windows applications using simple voice commands.

Vendors say speech recognition won't replace the keyboard or mouse any time soon, but it's much faster for certain tasks. A speech recognition–capable soundboard, software, and microphone let you use single-word commands to launch *Windows* applications and easily perform commands like highlight, delete, cut, and paste.

Microsoft is among the first to offer a speech recognition product for *Windows*. Its Windows Sound System, a hardware-software combo that includes a PC add-in audio card, a microphone, and headphones, offers software "vocabularies" for 15 popular *Windows* applications.

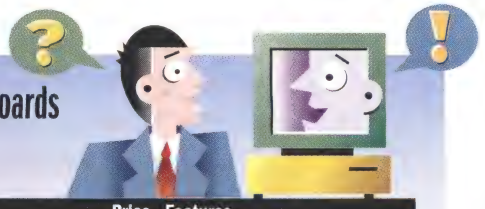
In addition to Microsoft and IBM, many smaller vendors are introducing soundboards with speech recognition. A number of companies, including Best Data Products, Cardinal Technologies, Computer Peripherals, Digitan Systems, JetPad Systems, Kingston Technology, and Zoltrix have or plan to have products based on Sierra Semiconductor's Aria Listener chip set. Street prices range from under $200 to $400.

"The prices are pretty attractive now, and we're looking for wide appeal when they drop under the hundred dollar level," says analyst Bill Ablondi of BIS Strategic Decisions in Norwell, Massachusetts. Considering the intense competition, the $100 mark could be attained fairly soon, according to Ablondi.

"We are seeing speech recognition enter the mainstream business community for the first time," says Dr. Janet Baker, president of Dragon Systems in Newton, Massachusetts, a leading speech recognition software developer whose technology is included in both IBM's and Microsoft's speech software.

But speech recognition can be a hard sell. Used to seeing characters "talk" to computers in science fiction movies and on TV shows such as *Star Trek*, people often "have unrealistic expectations" of what speech recognition can do, says Bob McBreen, product manager for Microsoft's Windows Sound System in Redmond, Washington. He says the solution is to avoid overselling the product. McBreen doesn't recommend Sound System for stock exchanges or other environments where background chatter can make speech recognition difficult. "It's designed for the standard office," he says.

—Jeff Bertolucci



Speech Recognition Boards Reach the Market

Company	Product	Price	Features
Computer Peripherals	ViVa Maestro 16VR	$399	DSP-based stereo soundboard, SCSI port, software
Cardinal Technologies	Soundpilot	$399	16-bit stereo soundboard, software
Microsoft	Windows Sound System	$289	16-bit PC audio card, microphone, headphones, software
IBM	Dragon Talk To Plus	$149	Software for controlling Windows using voice commands

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A Few Pointers for Portables

Location, location, location. The maxim that dictates value in the real-estate market also applies to notebooks. With space at a premium, choosing a notebook with its pointing device in the right location and configuration for you can make the difference between owning a highly productive tool or lugging around a source of constant irritation.

Driven largely by the migration of *Windows* to mobile computers, vendors have experimented with countless iterations of pointing devices designed to achieve the right combination of ergonomic design, usefulness, and size.

One company that seems to have hit the winning combination is Apple Computer. Its fabulously popular PowerBook portable Macintosh, introduced in October of 1991, includes an integrated trackball centered in front of the keyboard. Many vendors agree the trackball's location and size are optimal, and buyers concur. In just one year Apple has sold over 400,000 units, placing it among the top three notebook vendors by volume.

The Mouse That Roared

While Apple's integrated trackball is not the only reason for the PowerBook's success, its convenience is a distinguishing characteristic. Following Apple's lead, nearly every notebook vendor now offers either an integrated pointing device or a nifty snap-on alternative.

Location remains the sticking point; there just isn't a lot of room on your typical notebook. Vendors' efforts to compete with the PowerBook without sacrificing size or weight have led to a wide variety of solutions. Most notebook vendors have settled the pointing device somewhere on top of the keyboard, a few nestle it by the cursor keys, and Compaq and BCC have installed theirs on the screen panel.

"We felt we had to integrate the trackball or lose sales," explained S. M. Kim, strategic marketing manager at Hyundai Electronics America. Although a significant number of vendors expressed dissatisfaction with the current placement of their trackballs, they claim that integration, regardless of its convenience, drives the buying decision. Jon Thomas, vice president of sales at Altima Systems said of Altima's trackball (which is located above the keyboard), "Customers like having it, and they adapt to the location."

Mice Run Amuck

And then there are the daring innovators. IBM's ThinkPad features the TrackPoint II, an eraserlike joystick nestled in the middle of the keyboard, which you steer with a fingertip (the buttons are below the <Space> bar). AST Research and Zenith Data Systems went the clip-on route with trackball expansion panels that attach to the front of their new notebooks. Everex's Impact line of modular portables features a trackball that nests within the computer for storage and flips out to occupy a port on the right or left side. Another approach has been adopted by, among others, Texas Instruments and Toshiba America. Both companies use the QuickPort BallPoint mouse from Microsoft, a cableless trackball that connects directly to the side of the notebook.

The market for separate pointing devices remains brisk, with steady sellers such as the Microsoft BallPoint Mouse (the regular version of the QuickPort) and the Logitech TrackMan Portable, trackball devices that attach to your notebook with clips. A new addition to the menagerie is the PortaPoint device from Interlink Electronics, a pressure-sensitive button that you push with your finger to dictate direction and speed.

Even if a trackball is not conveniently located, users seem to prefer integration. Jim Metzler, CPA partner at Gaines, Emhof, Metzler & Kriner in Buffalo, says, "I already carry around a ten-key pad as well as the power supply. I don't want anything else."

Scot Schulte of Logitech, which manufactures the trackball device for the PowerBook as well as other machines, predicts that vendors will heed user demands quickly. "Within 18 months virtually every portable computer sold will include an integrated device of some sort."

—Melissa R. Riofrio

NEW-AGE POINTING DEVICES, clockwise from top right: Everex Impact movable unit; PowerBook trackball, below; Logitech TrackMan Portable; AST SmartPoint and ZDS LitePoint.

JOHN GREENLEIGH

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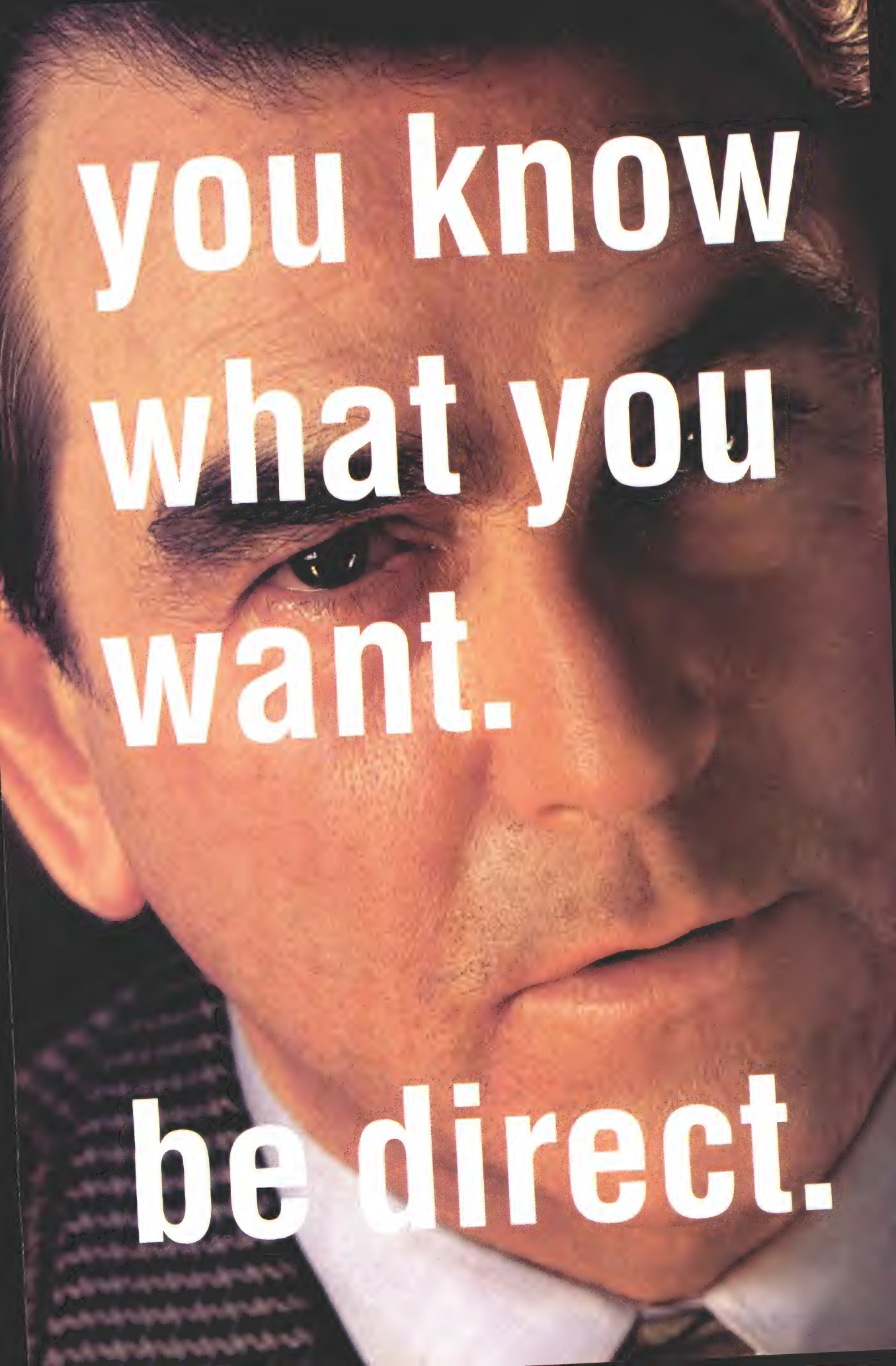
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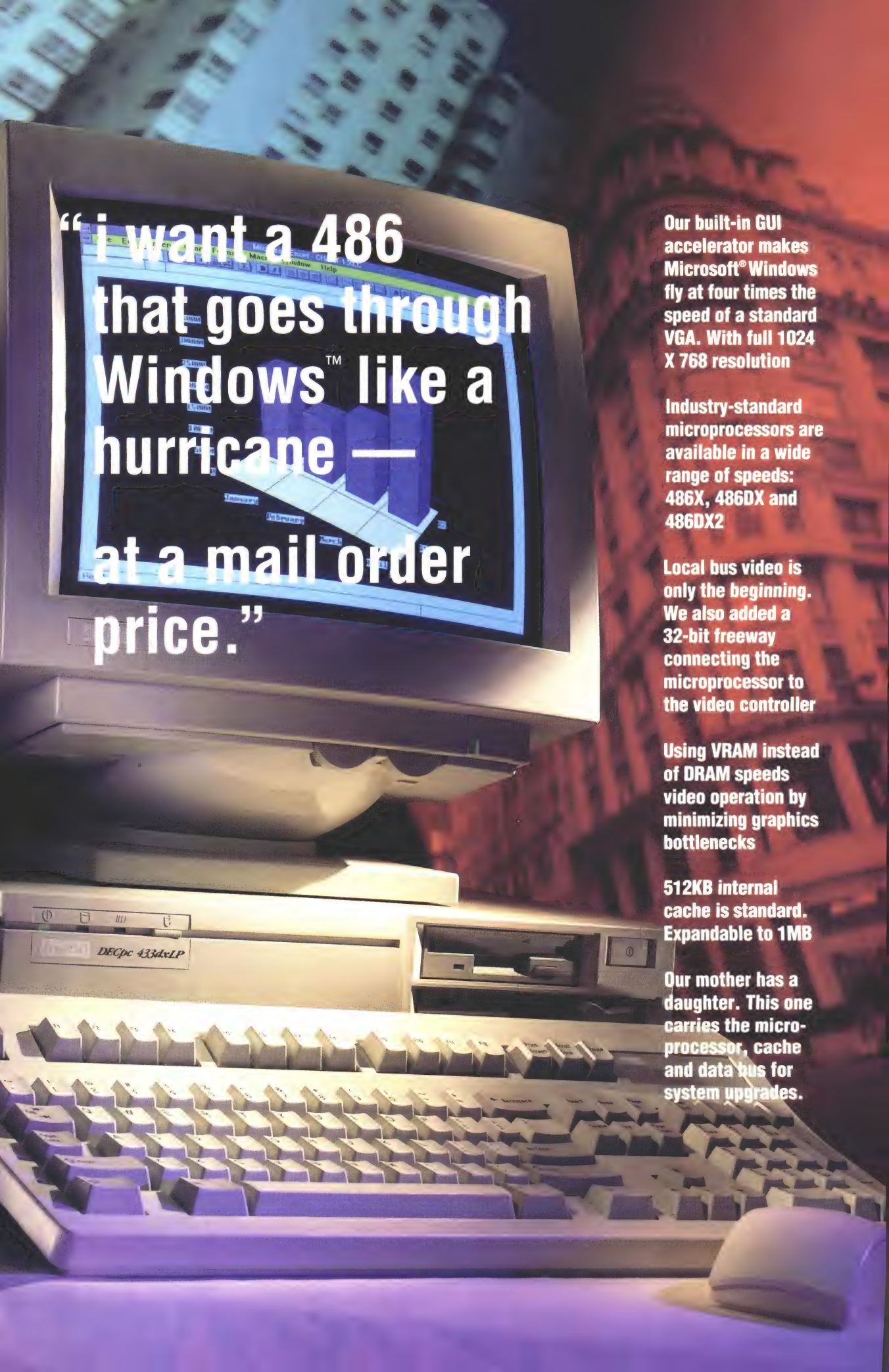

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We used PC Magazine Labs' Hardware Performance Tests, Release 6.0, to measure each PC's performance. The Graphics Winmark is the geometric mean of 12 Windows-based graphics tests from WINBENCH 2.5, weighted to reflect how frequently various functions are used.

Higher scores represent better performance.	Processor (operations per second)	Memory (kilobytes per second)	Disk (kilobytes per second)	Video (thousands of operations per second)	Graphics Winmark (megapixels per second)
DECpc 450d2 LP (486DX2/50)	506	5,406	193	2,182	12.98
50-MHz 486DX2 average	487	6,430	276	2,539	5.51
Dell System 486D/50 (486DX2/50)	450	5,525	241	4,272	1.58

PC MAGAZINE November 24, 1992

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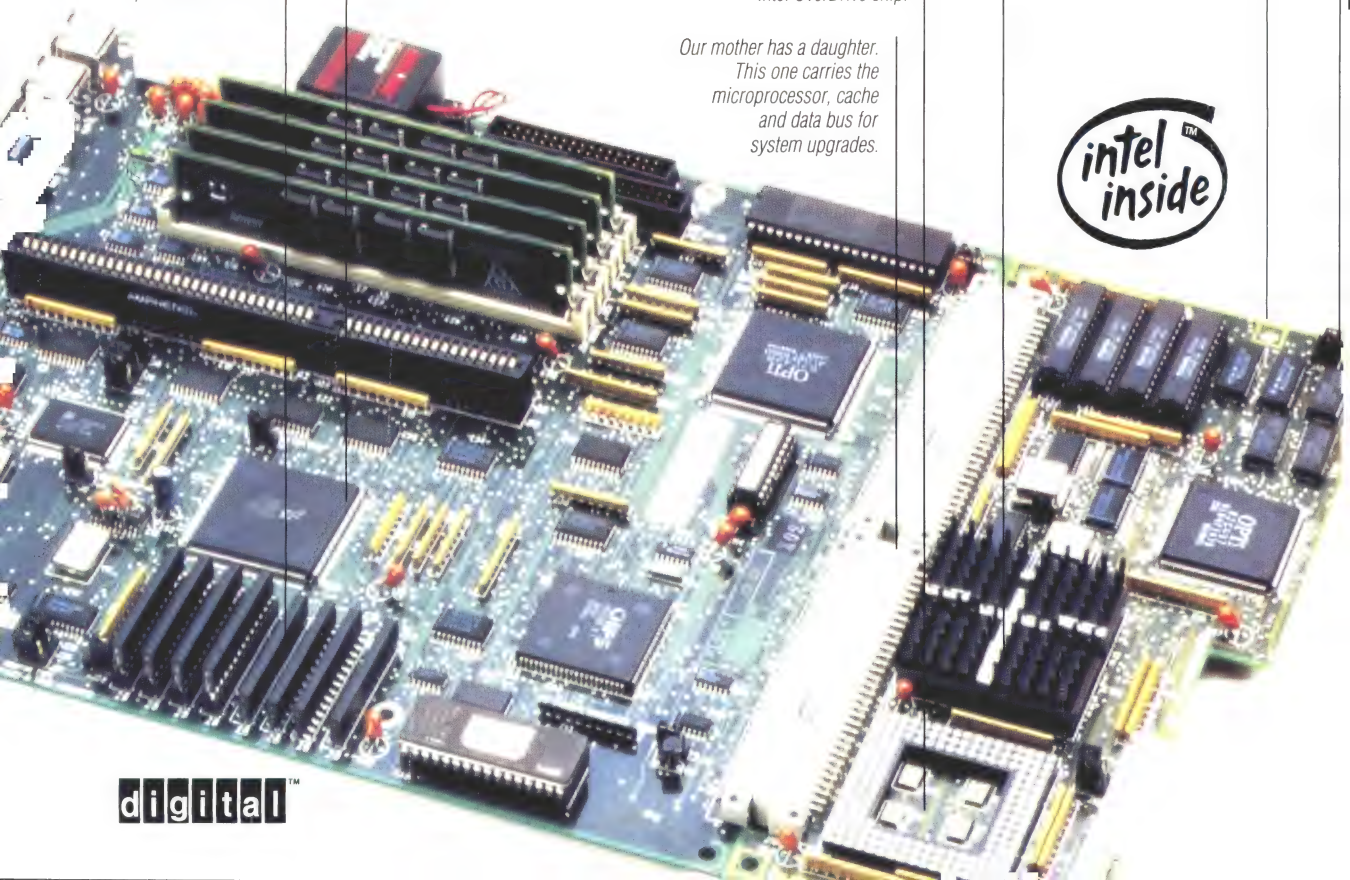

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Overall weighted score		3.6	3.5	2.4	4.0	2.8	3.4
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3. Expendability	(25%)	4	3	3	4	2	3
4. Serviceability	(10%)	3	3	2	4	3	4
5. Quality of construction	(10%)	3	2	3	4	3	3

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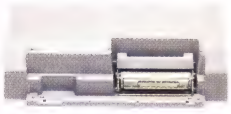
•Warranty coverage may be extended with one- or two-year Return-to-Factory Contract Extension. •Warranty coverage may be enhanced with DEC Passport Service

DECpc 325SL Notebook
Base System
• i386SL 25MHz System
• 4MB RAM
• 80MB Hard Drive
• LCD VGA Super Twist Sidelit Display (64 grey scale, 9.5" diagonal)
• 3.5" 1.44MB Floppy Drive
• Removable trackball
• 6.5 hour battery
$2,399

DECpc 325SL Notebook Plus
• i386SL 25MHz System
• 4MB RAM
• 120MB Hard Drive
• LCD VGA Super Twist Sidelit Display (64 grey scale, 9.5" diagonal)
• 3.5" 1.44MB Floppy Drive
• Removable trackball
• 6.5 hour battery
$2,599

DECpc 325SL Color Notebook
• i386SL 25MHz System
• 4MB RAM
• 120MB Hard Drive
• 256-Color Passive Matrix Display
• 3.5" 1.44MB Floppy Drive
• Removable trackball
• 6.5 hour battery
$3,399



DECpc 325SL Docking Station
• One full and one half-length 16-bit IBM PC/AT option slot
• One slim-line and one half-height 5¼" drive bay
• Serial communications port
• Parallel printer port
• External PS/2 keyboard port
• External PS/2 mouse port
• External VGA monitor port
• Auto-sensing 115-230V power supply with battery charger
• IEC auxiliary AC power outlet
$379

Orchid, Sigma Provide Audio With Your Video

In the rush of ever-faster, ever-more-colorful graphics controllers entering the market, it's getting hard to tell one video board from another. Not so with a couple of recent products that give you sound in addition to speedy graphics.

THE $299 ORCHID FAHRENHEIT VA is one of several new video boards that combine speedy, high-resolution video with audio capabilities.

Orchid Fahrenheit VA

The *VA* in the name stands for *Voice Annotation*. That's what Orchid figures business users want in the way of sound—the ability to add the audio equivalent of Post-it notes to documents in OLE-compliant *Windows* applications. The board comes with a microphone and cabling to connect it to your PC's internal speaker, and it has jacks for external speakers or headphones.

Don't forget this is a video board too, and no slouch at that. It's based on S3's S3C801 processor, one of the new generation of graphics accelerator chips. Orchid has also substantially improved its *Windows* video driver.

Orchid claims that between the new chip and the rewritten driver, the Fahrenheit VA is twice as fast as its predecessor, the Fahrenheit 1280. It can produce 16.8 million colors at 640 by 480 resolution and 256 colors at 1024 by 768 (with a 72-Hz refresh rate).

An ISA version of the Fahrenheit VA with 1MB of DRAM is available for $299. Orchid also plans a VESA local-bus version of the board (using S3's S3C805 local bus chip), which it claims will be 30 percent faster than the ISA counterpart. The VL-bus board will be available in 1MB and 2MB configurations; Price was not set at press time.

Sigma Designs WinStorm

Sigma Designs has been a respected name in the high-end graphics market for some time, and its WinStorm video board upholds that reputation. Like the Fahrenheit VA, it combines audio and video capabilities on one card. However, the WinStorm's sound capabilities are aimed at the higher end of the market.

Unlike the Fahrenheit VA, which is more appropriate for such undemanding sound applications as voice playback, the WinStorm is capable of 16-bit audio—as good as your CD player at home. You also get interfaces for a SCSI CD ROM and a MIDI connector. Sigma says the board is compatible with SoundBlaster, Pro Audio-Spectrum, and other popular soundboards.

The WinStorm delivers the latest in video performance: 24-bit color with 16.8 million colors at 640 by 480 resolution and 256 colors at 1024 by 768, all at a flicker-free 72-Hz refresh rate.

The WinStorm lists for $429 and includes a collection of multimedia software.

—Dan Miller

Fahrenheit VA
Twice as fast as its predecessor, the Fahrenheit VA also offers voice annotation.

Orchid Technology
800/767-2443,
510/490-9312 (fax)
List price: $299
Reader service no. 646

WinStorm
WinStorm combines audio and video with a SCSI interface.

Sigma Designs
800/845-8086,
510/770-2640 (fax)
List price: $429
Reader service no. 647

Hercules Joins the Accelerator Race

Hercules was one of the original big names in the graphics controller market, but in recent years it has been content to produce fast, high-res video boards (with prices to match) for CAD and specialized graphics apps.

With the introduction of the new Hercules Graphite board, however, the company appears ready to move back into the graphics mainstream.

Despite its relatively low price—$399—the Graphite reflects Hercules' experience at the high end. It uses a 32-bit, high-speed RISC graphics processor and a sophisticated video memory subsystem. Like other video accelerators, the Graphite off-loads such functions as line drawing and bit-block transfers from the CPU; it also handles jobs like shading and dithering.

The board can produce 16.8 million colors (at 640 by 480 resolution) and resolutions up to 1280 by 1024 (interlaced, with 16 colors). At 1024 by 768 resolution, the Graphite supports a vertical refresh rate of 80 Hz—well above the norm.

—Dan Miller

Hercules Graphite Card
32-bit graphics processing.

Hercules Computer Technology
800/532-0600,
510/623-1112 (fax)
List price: $399
Reader service no. 648

Hyundai and Gecco Roll Out Local-Bus PCs

HYUNDAI'S NEW VL-BUS PCs range from an entry-level 25-MHz 486SX ($1799) to a 66-MHz 486DX2 ($2995).

Two very different companies are taking a similar approach to designing systems that conform to the VESA local-bus standard. The U.S. arm of the South Korean Hyundai conglomerate and tiny Gecco Computers have both introduced low-priced VL-bus systems that offer a 32-bit-wide high-speed local-bus slot for enhanced performance.

Hyundai is selling VL-bus computers in almost every color of the 486 rainbow, from an entry-level 25-MHz SX to a clock-doubled 66-MHz DX2. The $1799 425S starts things off with 4MB of RAM expandable to 64MB and a 120MB hard drive. At the high end is Hyundai's $2995 466D2 with 8MB of RAM expandable to 64MB and a 360MB IDE hard drive. Both systems have 128K of secondary cache.

All the Hyundai 486 systems include a VL-bus–compatible ATI Ultra Pro accelerator board preinstalled in the lone VL-bus slot. Desktop models feature six ISA expansion slots, seven drive bays, and two floppy drives.

Gecco Computers is shipping a 66-MHz VL-bus tower system for $2995 and a desktop 33-MHz EISA system for $2290. The Gecco 486VL-66E has 8MB of RAM expandable to 64MB, a 245MB hard drive, and 256K of secondary cache. The system's hard disk runs off a 32-bit EISA IDE controller; the VL slot can be used for video.

The tower model offers eight drive bays, eight expansion slots, and a 250-watt power supply. Besides the lone VL-bus slot, the 486VL-66E has three ISA and four 32-bit EISA slots. The system is built to manage the notoriously hotheaded 66-MHz 486DX2 chip, with a two-speed, heat-sensitive fan and a CPU-mounted heat-sink/fan.

Both firms include strong support packages. All Hyundai direct-mail customers receive an 18-month system warranty, 12-month on-site service, and free 24-hour phone support. Gecco provides two years of on-site service for its systems and a two-year parts warranty.

—Michael Desmond

VL-Bus systems

Two EISA-equipped VESA local-bus models from Gecco and affordable 486 VL-bus computers from Hyundai.

Gecco Computers
800/486-0386,
602/967-3610 (fax)
List price: $2290 and $2995
Reader service no. 650

Hyundai Information Systems
800/933-3445,
408/473-9349 (fax)
List price: $1799 to $2995
Reader service no. 651

Extra Battery Gives Panasonic Note a Double Life

New low-voltage chips, innovative energy-efficient designs, and advanced power-management software mean you get more life from today's notebook batteries. Nowhere are these gains more evident than in Panasonic's new CF-1000, a power-stingy, 5-pound notebook with a removable floppy drive. Pop out the floppy, pop an extra battery pack in the now-empty bay, and the CF-1000 will run from 6 to 11 hours between charges, Panasonic claims.

CF-1000

Panasonic's power-saving notebook includes a removable floppy drive, an extra battery pack, and AMD's low-power AM 386SXLV chip.

Panasonic Communications & Systems Co.
800/742-8086
List price: with 60MB hard drive $2299, with 120MB drive $2699
Reader service no. 649

Without the extra battery, the CF-1000 should run from 3 to 5½ hours, depending on usage. Like many newer notes, the CF-1000 uses nickel metal-hydride batteries that recharge in about 2 hours. Power-saving innovations include AMD's 25-MHz AM 386SXLV microprocessor. Designed for notebooks, this low-power, 386SX-compatible chip draws 3.3 volts of power instead of the 5 volts conventional processors need.

The CF-1000 offers most essential notebook features, including a sidelit, 9½-inch LCD VGA display and a 60MB or 120MB internal hard drive. AddStor's preinstalled *SuperStor* disk compression utility greatly increases (in some cases even doubles) your disk's storage capacity. The unit comes with 4MB of RAM, expandable to 12MB. The 84-key keyboard's dedicated <Home>, <End>, <Page Up>, and <Page Down> keys are a nice touch for speed typists.

The CF-1000 is just 1¼ inches thick—a pleasure for travelers. With a travel weight of 6 pounds (including an AC adapter, an extra battery, cables, and a carrying case), the CF-1000 isn't the lightest portable, but its dual batteries and low-power design give it more staying power than most.

The CF-1000 with a 60MB hard drive costs $2299; the 120MB model is $2699. An internal fax-modem costs $190.

—Jeff Bertolucci

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Curtis Keyboard SpaceSaver II: For slide-away storage under monitor • Built-in drawer holds supplies, paper to legal size. Lifetime Warranty. Made in USA. #KS-2 Retail . . . $49.95

2. Curtis Keyboard SpaceSaver: Slide keyboard away when not in use • Protect keyboard from spills, debris • Fits any keyboard. Lifetime Warranty. Made in USA. #KS-1 Retail . . . $39.95

3. Curtis Universal Printer Stand: Store paper underneath • Fits any printer, standard or wide carriage, rear or center paperfeed • Stacks printouts in detachable receiving tray. Lifetime Warranty. Made in USA. #PS-1 Retail . . . $24.95

4. Curtis Universal System Stand: Holds CPU or System Unit vertically • Adjusts from 4" to 7½" wide • Reduces footprint by up to 54%. Lifetime Warranty. Made in USA. #SS-3 Retail . . . $29.95

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NEC's Ready Systems Offer Rapid Setup

EACH NEC READY SYSTEM comes ready to run with preloaded software, a 2400-bps fax-modem, and your choice of a 386 or 486 microprocessor.

Small businesses and home users will appreciate NEC's new Ready systems: three software-loaded PCs that are quick to set up and backed by the company's helpful remote assistance. These plug-and-work PCs are simple to get up and running in under half an hour.

A videotape shows the components of the system and how to put them together. Plug in the system, and a preloaded software tutorial with colorful graphics explains everything from components to keyboard techniques. More experienced users can skip familiar sections.

NEC's $1199 386SX-based Ready 325 has a 120MB hard disk drive and 2MB RAM (expandable to 20MB); while the $1599 486SX-based 425 and the $1999 486DX-based 433 have a 170MB hard disk and 4MB RAM (expandable to 64MB). Prices do not include monitors. Along with *Windows 3.1* and MS-DOS 5.0, the systems have a customized version of *Norton Desktop 2.0* to make using *Windows* easy.

An extensive installed software group is one of the Ready systems' biggest advantages. Included are Prodigy, *Norton AntiVirus*, and *PFS:WindowWorks*, which has word processor, charting, spreadsheet, database, address book, and label maker modules. Also included are 24 templates for small-business balance sheets, sales projections, and commercial credit applications. To go with their built-in 2400-bps fax-modem, all the systems have Delrina's *WinFax*, which lets you fax from within applications. The 425 and 433 models also have *Quicken* accounting software.

Support includes a one-year on-site limited warranty and a toll-free hotline. But the real bonus is the new Ready remote service, which lets NEC's support staff troubleshoot by modem. If a problem isn't solvable by phone, the user can pop in a remote support disk so the technician can dial into the user's system to analyze the problem and fix it.

The Ready 425 and 433 systems support 24-bit true color applications in 680 by 480 resolution and have three ISA expansion slots plus Intel OverDrive sockets so you can upgrade to the new 50- and 66-MHz CPUs.

—Laurianne McLaughlin

NEC Ready Systems

Preloaded plug-and-work systems with a built-in fax-modem and a multitalented software group.

NEC Technologies
800/388-8888
List price: Ready 325 (386SX-25) $1199, Ready 425 (486SX-25) $1599, Ready 433 (486DX-33) $1999; Ready 1024 monitor $399
Reader service no. 652

Alphatronix Inspires Top-Speed Optical Drives

Magneto-optical (MO) drives are ideal for storing huge data files. Since their MO disks are removable, these drives are also useful for high-security government and business applications. And MO drives are becoming increasingly faster and cheaper.

Alphatronix's new Inspire II 5¼-inch MO drives continue this welcome evolution. With performance speeds approaching those of today's hard drives, massive storage capacities of 650MB or 1GB on each removable cartridge, and prices 40 percent cheaper than Alphatronix's first generation of MO offerings, these drives bring mass storage one step closer to the masses.

Alphatronix claims the Inspire II MO drives are among the fastest on the market, with average seek times as low as 23ms (outstanding for MO drives but slow for Winchesters, which typically score in the teens). The company credits several design enhancements for the speed boost: new lightweight heads that move faster across the disk, disks that spin at 3600 rpm rather than 2400, and new digital servos that keep the heads aligned at the faster rpms.

The Inspire II models, like all MO drives, are great for archiving data. Their removable, 5¼-inch disks eject from the front of the unit, making reloading a breeze.

The Inspire II drives cost $4495 for the 650MB model, $4995 for the 1GB; they work with AT compatibles and PS/2s.

—Jeff Bertolucci

Inspire II

New magneto-optical drives offer higher speeds and storage capacities up to 1GB.

Alphatronix
919/544-0001,
919/544-4079 (fax)
List price: 650MB $4495, 1GB $4995
Reader service no. 653

OKIDATA USES 2,560 BURSTS OF LIGHT TO MAKE YOU LOOK BRILLIANT.

If you think all laser printers are mirror images of each other, meet the one that broke the mirror.

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Print samples created using popular software packages and printed on a range of Okidata LED Page Printers. *5 year limited warranty on LED printhead plus 1 year parts/labor on entire printer. OKIDATA and the OKI OK! are registered trademarks of Oki Electric Industry Co., Ltd. "We don't just design it to work. We design it to work wonders." is a registered trademark of Oki America, Inc.

Circle 199 on reader service card

FoxPro 2.5: The Fastest Windows Database Looks Familiar

While most of *FoxPro*'s competitors claim they're easier to learn and more intuitive, few of them can challenge *FoxPro 2.5*'s performance and cross-platform compatibility.

This version of *FoxPro* represents round two in Microsoft's preemptive strike against Borland's yet-to-ship *dBASE for Windows*. The first update since Microsoft acquired Fox Software in mid-1992, *FoxPro for Windows 2.5* and *FoxPro for DOS 2.5* arrive almost in tandem with Microsoft's well-received and user-friendly *Access* database for *Windows*.

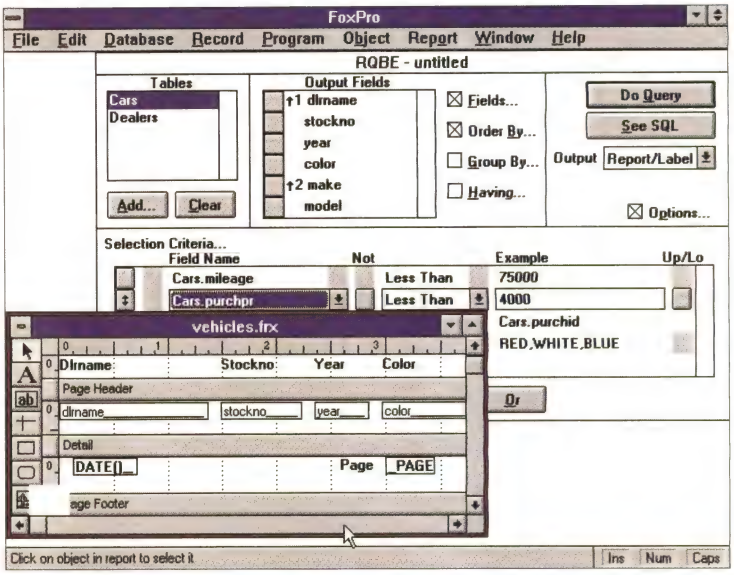
While *Access* hasn't earned bragging rights for performance, *FoxPro* shatters the myth that *Windows* application performance is synonymous with *slow*. Its remarkable Rushmore technology, already orders of magnitude faster than many competitors at solving most common queries, has been further tuned. Informal desktop previews show it dishing up multitable queries even faster than its DOS counterpart.

Looks Just Like FoxPro

FoxPro for Windows 2.5's most remarkable feature is what isn't new. Most new *Windows* versions of DOS software ambush loyal users with a totally reorganized interface. Fortunately, *FoxPro*'s DOS predecessor already sported system menus in addition to its multiwindowed and mouse-aware screens; *FoxPro for Windows 2.5* offers GUI variations on these very same elements.

The system menu now conforms more closely to those of other Microsoft products. You'll immediately notice the system drop-down menu is gone; its bars, as well as many from the *Windows* drop-down, have been relocated to the program and help drop-downs.

Fox's RQBE query builder screen doesn't mimic a traditional query-by-example layout, but its structure offers more guidance than the SQL text editor dialogs often seen in *Windows* software. Fox's Report Writer lets you specify fonts and point sizes, while an added WYSIWYG page preview zooms in and out and also pages forward and back. Support for snaking columns is a bonus.



FOXPRO 2.5 COMES TO WINDOWS with spiffy new push buttons, check boxes, and scrollable lists, while keeping much of the look and feel of the DOS version.

FoxPro's screen painter and label maker and its superb browse window closely resemble the DOS-based *FoxPro 2.0*, but they look spiffier, thanks to new fonts and graphics elements such as push buttons, check boxes, and scrollable lists that now have that steely, chiseled *Windows* look. The easy-to-use applications generator, FoxApp, produces remarkably robust and usable applications, but you still have to write program files to enforce any serious data validation.

Remarkably, you can run old programs, such as those written with *dBASE III Plus*, *Foxbase Plus*, or *dBASE IV*. And if you like, *FoxPro for Windows 2.5* will run character-based applications dutifully without modification. But here's the amazing part: Using a cross-platform transport utility, you can bring old *FoxPro for DOS* applications into the *Windows* world by replacing old DOS screen elements with check boxes, buttons, shaded fields, and other GUI accoutrements.

Window Shopping

Most other new assets, such as the support provided for the Clipboard, DDE, and OLE, are contributed by *Windows*. You can place a document (or sound, images, even a video clip) in a memo field of a *FoxPro* data file. Double-clicking on such a field launches the associated application and opens the document. More subtle benefits wait in utilities like spelling checkers and graph engines, which attach effortlessly to *FoxPro* via *Windows* Dynamic Link Libraries without adding to *FoxPro*'s size or complexity. You can even hot-link data between an *Excel* spreadsheet and a *FoxPro* data file, though you'll have to write the DDE commands.

For those willing to master *FoxPro*'s programmable extensions to the dBASE language, the program provides a sturdy platform for complex multifile database work. If you wish to build applications without programming, however, its command-based architecture won't get you as far as fast as *Paradox for Windows* or Microsoft's own *Access*. But when it's time to get a handle on those really *big* data files or to construct a single application for DOS and *Windows* users, *FoxPro 2.5* offers a very attractive solution.

—Alan Schwartz

FoxPro for Windows 2.5

WINDOWS The fastest data manager in Windows is not for novices, but it offers a cross-platform transport utility that trades DOS screen elements for Windows accoutrements.

Microsoft Corp.
206/882-8080,
206/635-7190 (fax)
List price: $495, additional $425 per user
Reader service no. 654

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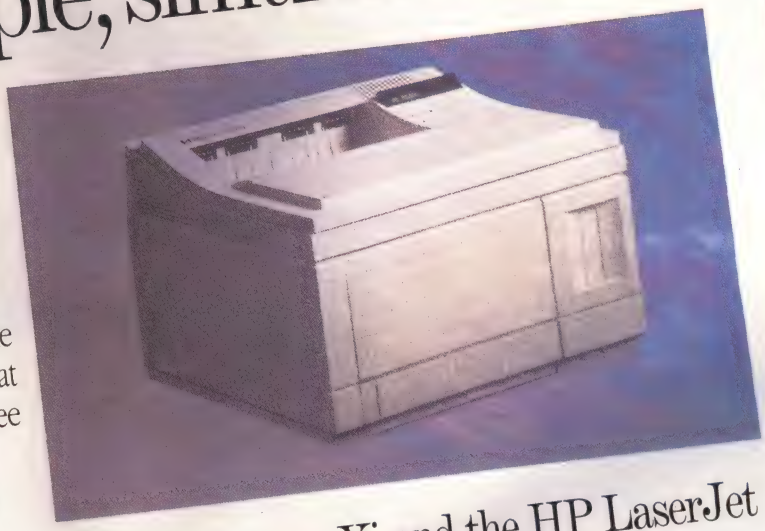

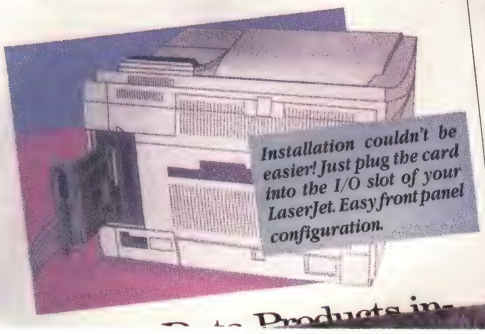

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** Also compatible with HP PaintJet® XL300 and DesignJet® plotter*

SAN DIEGO—Pacific ... on the LaserJet II, IID, ... This includes the price

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Find and Retrieve Documents on Any Server With PC DOCS OPEN

PC DOCS OPEN

WINDOWS PC DOCS OPEN brings sophisticated, LAN-based document management to Windows.

PC DOCS, Inc.
800/933-3627,
904/942-1517 (fax)
List price: $295 per LAN node (five-node minimum)
Reader service no. 655

Sharing data files over a network can be a disaster waiting to happen. Once you've tracked down every revision of a file, you've still got to figure out who did what to which. And when you've got data sitting on servers all over the globe, the problems multiply like bacteria. That's where programs like *PC DOCS OPEN* come in.

PC DOCS OPEN lets you locate and retrieve documents from any server hooked to your network—whether it's down the hall or in Tokyo. And unlike its previous, NetWare-only DOS incarnation, the $295 *Windows*-based *DOCS* works with all major LAN systems, including Banyan's VINES and Microsoft's *LAN Manager*. It's also compatible with virtually any SQL-based database and a variety of storage devices, including tape and optical drives.

DOCS installs directly into the menu bar of major *Windows* applications, including *WinWord, Ami Pro,* and *1-2-3*. Or you can run it as your *Windows* desktop, launching applications from file lists and clicking on icons to retrieve files, create project folders, and view, print, or fax documents.

To track a document, you start by filling out a profile with the file name, author, client information, and other data, then store the document in a project folder. *DOCS* keeps tabs on who's opened the document, what they did to it, and when, as well as keeping track of any notes they've attached. Security features let you control access.

Need to find a file in a hurry? *DOCS'* Quick Retrieve function provides a list of the last 20 files you opened and lets you view the files or launch their associated apps with a click. To find a file not on the list, you fill in a customizable query-by-example form—essentially a profile dialog box—and specify search parameters, which you can save and reuse. *DOCS* will then display a list of all files that meet your criteria.

—Daniel Tynan

America Online Gets a Fresh Look

America Online for Windows

WINDOWS America Online for Windows makes it easy to navigate the service and multitask with other Windows applications.

America Online, Inc.
800/827-6364
Cost: Software free to AOL users; AOL service $7.95 per month plus 10 cents per minute after first 2 hours
Reader service no. 659

America Online for Windows' colorful interface brings you the comforting familiarity of *Windows* and several new features designed to make your on-line session more productive.

A handy button-based tool bar across the top of the screen allows you to move through the service with ease. You can click on buttons in *America Online for Windows* to access each of the service's seven departments, the file download manager, and several search options. No matter how many levels deep you are in one area, you can switch instantly to another by clicking one of the buttons, all of which always remain on screen.

By March the software should include 9600-bps modem access. *AOL for Windows* is free to current America Online users. New members get a one-time, 5-hour free trial period. The standard charge is $7.95 per month plus 10 cents per minute after the first 2 hours.

—Anita Hamilton

CA Updates Accpac Line

Hoping to capitalize on the growing interest in international trade, Computer Associates has released version 6.1 of its *Accpac Plus* accounting package with support for multicurrency accounting built into the general ledger. Among the features are support for unlimited foreign currencies, automatic revaluation of fluctuating exchange rates, and account balances in multiple currencies.

Also new are a Purchase Order module for preparing and tracking purchase orders, and *DynaView*, an add-on analytical tool that links *Accpac Plus* data with *SuperCalc* and *1-2-3* spreadsheets for preparing consolidated financial statements, creating reports, and analyzing financial data.

Accpac Plus 6.1's General Ledger and new Purchase Order modules cost $795 each; users of the previous version can upgrade the General Ledger for $99 through authorized resellers. *Accpac Plus DynaView* sells for $249. *Accpac Plus 6.1* requires DOS 3.1 or later, a hard drive, and 640K of RAM.

Also new from Computer Associates is version 2.0 of *Accpac Simply Accounting*, the company's entry-level *Windows* accounting package for small businesses. Version 2.0 includes support for cash-basis accounting, dynamic data exchange for linking accounting data with other *Windows* files, support for color, and improved forms handling. *Simply Accounting* retails for $199; upgrades are $75 from Computer Associates. *Accpac Simply Accounting* requires *Windows 3.1* or later.

—Roberta Furger

Accpac Plus 6.1, Accpac Simply Accounting 2.0

Multicurrency accounting tops the list of new features in Accpac Plus.

Computer Associates Int'l
800/225-5224
List price: Accpac Plus $795, upgrades $99–$295; Accpac Plus DynaView $249; Accpac Simply Accounting $199, upgrades $75
Reader service no. 656

Get a hold of the best value in LAN power protection

Now just $139! suggested list price

Blackouts, brownouts, sags... Your data and hardware are vulnerable to problems that surge suppressors and power directors are just not equipped to handle.

Now there's a complete Uninterruptible Power Supply solution to suit any budget. The Back-UPS™ 250 is reliable protection for LAN nodes, 386SX machines, 286, small PS/2 systems, and internetworking hardware such as routers, bridges, gateways and repeaters.

From the largest server to the smallest router, the Back-UPS Series will increase your productivity by providing a cost-effective solution to power problems. **Call for your free power protection handbook.**

The **Back-UPS 250** offers even more cost-effective protection for LAN nodes (typical runtime for a 386SX system is 10 minutes).

NEW!

Guaranteed ABSOLUTE™ Protection

- ABSOLUTE™ Protection guarantees repair or replacement of equipment (up to $25,000) if damaged by a surge while protected by a properly installed Back-UPS (See warranty for details).
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- Ask about PowerChute® UPS monitoring software and Novell compatible UPS monitoring boards
- 230V models available

LAN TIMES READERS CHOICE 1992

Computer Reseller News Editors' Choice

1991, 1990

	Model	Application	List	New List
	Back-UPS 250	LAN nodes, 386SX, 286, internet hardware, POS	~~$169~~	$139
	Back-UPS 400	Desktop 386, 486 systems, 286 servers	~~$249~~	$229
	Back-UPS 450	Tower 386, 486 systems, servers	~~$329~~	$279
	Back-UPS 600	Heavily configured systems, CAD/CAM workstations	~~$449~~	$399
NEW!	**Back-UPS 900**	Multiple systems, longer runtime applications		$599
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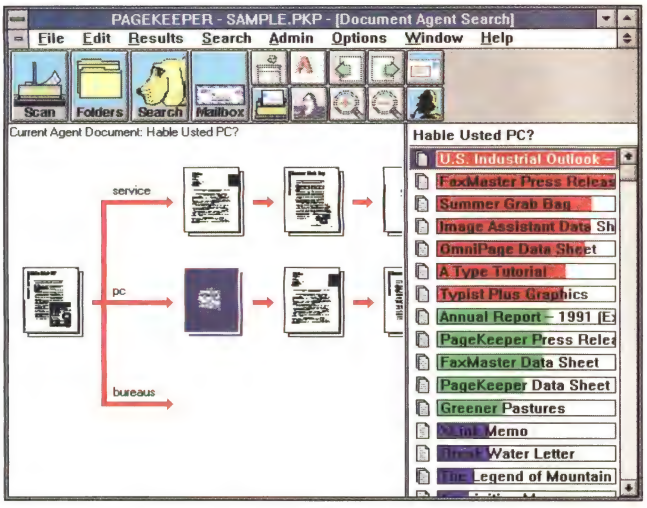
Circle 45 on reader service card

PageKeeper Retrieval Software Brings Your Files Back in Order



RETRIEVAL MADE EASY: Caere's PageKeeper color-codes files by order of relevance and graphically represents files on related topics.

The average size of the PC hard disk is growing rapidly, making it harder for you to find the right information among all the downloaded, typed, faxed, and scanned files in your desktop haystack. But with Caere's *PageKeeper*, you can instantly find the files you want.

This *Windows*-based information manager brings a combination of unique technologies to bear on the problem—an expert system to retrieve and order files, file compression and OCR to save space, and agents that can round up related files.

PageKeeper starts by automatically indexing the files already on your hard disk—or for that matter, on all the hard disks you'd care to designate on your network. *PageKeeper* analyzes the grammar and syntax in each file to identify all significant words (not just nouns) and their relative importance.

The only RAM overhead is the index file itself, but that is more than compensated for by Caere's SuperCompression technology, which moderately compresses text and saves images in a fraction of the space they would require otherwise. When you scan or fax in a document, Caere's OmniPage OCR technology automatically converts it from the typical 1MB bit map to a 30K to 50K word processing file (if you select that option) for considerably greater space savings.

At search time, *PageKeeper* analyzes each match based on the degree to which keywords predominate and presents its findings accordingly, so you start with the document that has the greatest number of references.

Because *PageKeeper* can fathom each document's content, you can specify one document and *PageKeeper* will retrieve others with related information.

The program lists for $895.

—Mike Hogan

PageKeeper

WINDOWS An information manager that helps you find text and graphics files.

Caere Corp.
800/535-7226,
408/354-2743 (fax)
List price: $895, five-user pack $1995
Reader service no. 657

Three Windows Utilities Help Manage Your System

System management for everyone, that's what Attitash Software delivers with a triple play of affordable utilities aimed at streamlining *Windows*. *WideAngle 3.0*, *SlingShot 2.0*, and *InfoPanel 1.0* help you organize your desktop, launch applications, and monitor your system

To simplify *Windows* multitasking, *WideAngle 3.0*, the company's $59.95 screen expansion utility, now uses a metaphor that should be familiar to any television viewer—an on-screen version of a remote control unit. With this virtual clicker, you select and move among full-screen applications as nimbly as a channel surfer in a LazyBoy.

Aside from the TV metaphor, other major refinements include support of hot keys for switching among DOS applications and drag-and-drop capability to set up channels.

WideAngle comes bundled with *SlingShot 2.0*, a program launcher that's a steal on its own at $9.95. *SlingShot* sits on top of *Windows* applications as a horizontal bar with a series of program icons and group names. To launch a program, you select the appropriate program group from a scrollable list and double-click the program's icon, or type in the first few letters of its name in a program bar.

SlingShot lets you create and edit *Windows* Program Manager groups or replace the Program Manager altogether. You can also create your own groups of frequently used applications to appear on the command bar.

Finally, *InfoPanel 1.0* is a $49.95 utility that lets you keep an eye on vital data such as free system resources, remaining disk capacity, and the status of system ports. Similar to Hewlett-Packard's *Dashboard*, it displays data using gauges, meters, and "oil lights."

InfoPanel goes beyond passive monitoring. It checks your hard disk for viruses by tracking program size and warns you of altered files. While no substitute for a full-featured antivirus package, it constantly guards against infection.

—Michael Desmond

WideAngle 3.0, SlingShot 2.0, InfoPanel 1.0

WINDOWS Attitash Software delivers a trio of easy-to-use utilities designed to make Windows better.

Attitash Software, Inc.
603/882-4809,
603/882-4936 (fax)
List price: WideAngle $59.95, SlingShot $9.95, InfoPanel $49.95
Reader service no. 658

Introducing CONNEXPERTS'®

NET Solution™

A comprehensive network solution for non-technical businesspeople.

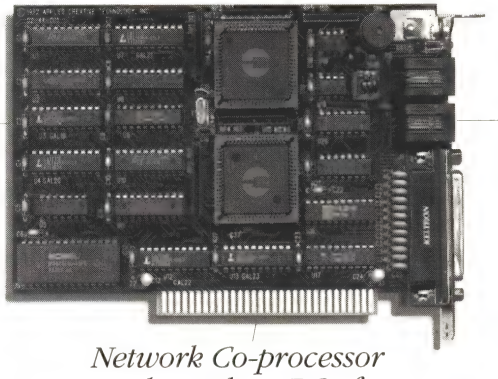
Our NET Solution is a family of networking products that includes all the elements needed for most networking applications. Based on a breakthrough networking technology called ACTLAN™, the NET Solution makes networking accessible to the average businessperson without compromising performance or compatibility with industry standards.

Consider first our Intelligent Network Connection Card, pictured here. Installation of this card does NOT involve selecting interrupts, I/O ports, shared memory locations or any of the other technical details one must tackle with all other network cards. Yet, despite the no-brainer installation, this card is more powerful and capable than any other network card available. Sounds like hyperbole; but as you read on you'll agree. For example: these cards form a peer-to-peer network capable of providing printer sharing, E-Mail and PC-to-PC file transfer services WITHOUT requiring a network operating system. Just plug them in and you've got a network.

12 Megabits-per-second transmission speed.

77,000 cps print server built-in

Up to 255 users



No NOS required, but can be used with most popular NOS's

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Other NET Solution add-ons include network tape backup, CD ROM sharing, modem sharing, and FAX sharing. The NET Solution is all its name implies.

$159
(introductory special)

And speaking of names, we're the CONNEXPERTS... as in "connectivity experts". We've been inventing and manufacturing connectivity products for over ten years, and everything we've learned is embodied in the NET Solution. If you are interested in a solid solution to your networking needs, connect with the experts. **Call 800-433-5373** or FAX 214-239-6490.

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Circle 37 on reader service card

Canvas for Windows: Top-Drawer Graphics

CorelDraw and *Micrografx Designer* had better take notice—there's a new gunslinger in the *Windows* illustration market, and it's aiming to become top draw. Deneba Software's *Canvas*, a leading illustration package on the Macintosh, comes to *Windows* armed to the teeth with top-notch design tools.

The $399 program should grab the interest of professional designers, occasional CAD users, and even on-screen presenters. The ability of the *Windows* version to exchange files with its Macintosh cousin is good news for shops that split graphics duties between platforms. Best of all, *Canvas*'s unique modular design lets you turn off the tools you don't need, enhancing speed and conserving system resources.

Canvas packs all the essential image-creation tools, plus extras like the ability to blend multiple objects and to work with scanned images as well as line drawings. Desktop publishers will appreciate the support for Pantone colors and CMYK color separation.

But *Canvas*'s firepower does not stop with pictures. You can automatically fit text inside a shape or wrap it around multiple objects on a page—a cool tool for creating flyers and brochures. And you can import PostScript or TrueType fonts and convert them to Bézier curves for creating logos and special text effects. (However, you can't export your custom text as a scalable font as you can with *CorelDraw* .)

Canvas's precision illustration tools blur the line between traditional drawing and 2-D CAD packages. You can place objects in increments of 1/65,000 of an inch and designate an unlimited number of layers. You can even search for objects, patterns, and colors within a multilayered drawing, which makes it easy to, say, replace all the blue triangles with green trapezoids.

Finally, designers who need to present their handiwork to clients or co-workers can use *Canvas*'s layering capabilities to create simple on-screen slide shows, complete with OLE links to live data.

While not for graphics greenhorns, *Canvas* gives old design hands all the tools they need for creating professional images.

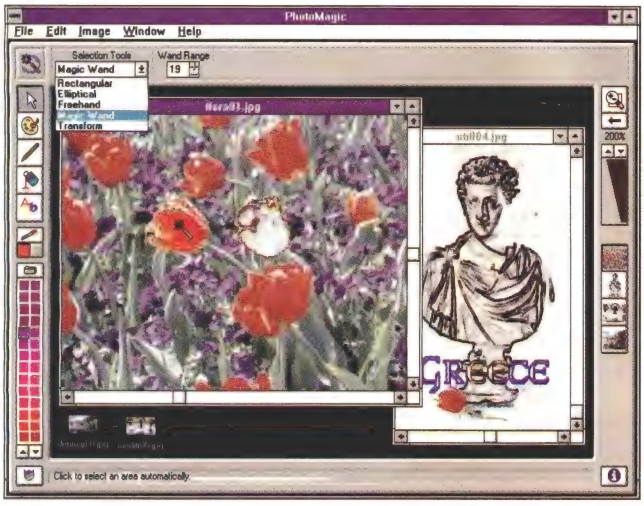
—Daniel Tynan

Canvas for Windows

WINDOWS The popular Macintosh illustration package brings its graphics power to Windows.

Deneba Software
800/622-6827,
305/273-9069 (fax)
List price: $399
Reader service no. 660

PhotoMagic Makes Image Editing a Snap



CLICK ON THE RED FLOWER with PhotoMagic's Magic Wand, and you select the entire flower—a faster way to copy or change an image.

Image editing was once the realm of publishing professionals or at least those willing to spend large sums on software for the purpose. No more. Micrografx, creator of *Picture Publisher*, has entered the low-end image editing market with *PhotoMagic for Windows*, a fully capable image editor that hovers just behind *Picture Publisher* in capability and lags far behind it in price, at just $149.95.

Anyone disinclined to learn new software will appreciate the coaching *PhotoMagic* offers. Move the cursor over any of the tools or buttons, and a cheat sheet appears at the bottom of the screen.

Since a major obstacle to image editing is the time and expense of scanning images, *PhotoMagic* ships with 250 24-bit color photos, organized by subject. To track these images, you get an image browser that creates thumbnails—even of images compressed in the JPEG format—so you don't have to rely on cryptic file names. Just click on the thumbnail to open the file. And of course, *PhotoMagic* supports all scanners through the TWAIN file format standard. It also supports Kodak Photo CD.

Image-editing tools include smooth, sharpen, and contrast, as well as some nice effects like wind, wave, twirl, pinch, punch, and splatter. And to speed up altering photos, you can preview an effect before enduring the slow, CPU-intensive act of implementing the change.

PhotoMagic does masking, lets you select image areas by color, and provides the usual ellipse, rectangle, and freehand selection tools. It doesn't do color separation.

—Christina Wood

PhotoMagic for Windows

WINDOWS PhotoMagic is a powerful, easy-to-use image editor that won't ravage your wallet.

Micrografx, Inc.
800/733-3729,
214/994-6475 (fax)
List price: $149.95
Reader service no. 661

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- Integrated debugger and a built-in applications generator
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dBASE has outsold all other databases. With more than three million users and the world's largest community of custom application developers and trainers, dBASE supports your data management needs in ways only the worldwide standard can. Now it's smarter than ever to go with #1.

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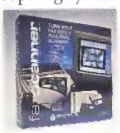

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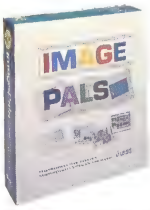

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AD LIB

BDO3231 **Ad Lib 1000 SCSI Adapter** **$59.95**
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LOTUS ORGANIZER

BDO5185 **Lotus Organizer** . . **$99.90**
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BDO6300 **Remote Power On/Off** **$149.95**
IBM PC, XT, AT and compatibles with 256K RAM.

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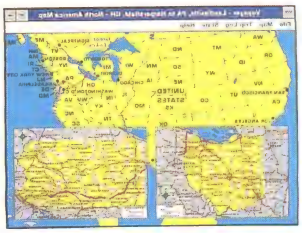
Voyager is a CD-ROM based route planning system for Windows that provides clear, reliable directions TO any place — FROM any place in North America. Want to go from Disney World to the Grand Canyon? Just tell Voyager and in seconds you'll have complete directions with detailed maps and a highlighted route.

Voyager includes megabytes of handsome, comprehensive maps like the ones you see on this page. You select the most direct route — or take your time, enjoy the drive and pick the most scenic route.

Planning a vacation or business trip is as easy as typing in your starting place and your destination. Voyager digs into its massive database of information, maps and statistics to provide an instantaneous route plan and points of interest along the way.



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PCWORLD BEST BUY

THE PC/COMPUTING 200 BEST PC PRODUCTS 1992

DBMS 1991 READERS' CHOICE

INFO WORLD EXCELLENT VALUE

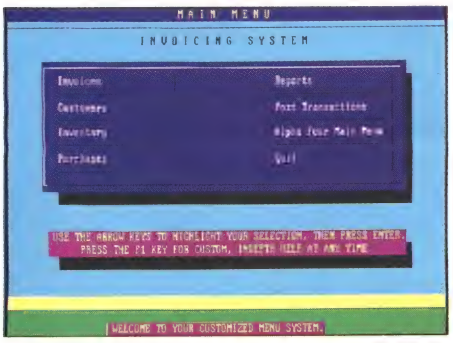
Awarded for Version 1.1 — Rated #1, *PC Week*, May 14, 1990; Excellent Value, *InfoWorld*, May 22, 1989; Editor's Choice, *PC Magazine*, December 17, 1991; Readers' Choice, *DBMS*, December 1991; Best Buy, *PC World*, March 1990.

Awarded for Version 2.0 — Top 200 and Best Value, *PC Computing*, June and August 1992; 3-1/2 Stars, *Home Office Computing*, September 1992; Top 100, *PC Sources*, October 1992; Top 200, *PC World*, December 1992; Readers' Choice, *DBMS*, December 1992; Readers' Choice (Honorable Mention), *Data Based Advisor*, December 1992; Editor's Pick, *Home Office Computing*, January, 1993; Best of 1992, *PC Magazine*, January 1993.

At first I backed off and priced out some programmers. Wow! Never mind. I'll try and do it myself. After surveying the numerous products out there I finally found the absolute best tool for creating custom applications — without the complications and time needed for writing code. Alpha FOUR — the database for Non-Programmers like me.

Alpha FOUR's Tutorial was magnificent — the best I've ever seen. In a few short hours I had the basics under my belt. I created my first database, complete with a colorful, custom screen and field rules that even capitalize the first letter of each word. It was incredibly easy.

From there I made my first application. Nothing to it. Alpha FOUR let me "paint" my menu, so you know it has lots of colors and looks good. Each menu selection starts a stored sequence of keystrokes (called a macro). For example, the "Find Customer" menu selection plays back the keys for 1) go to edit mode, and 2) go to find mode. When you select my menu item, a little box appears asking you for the customer's name. You enter it and the record is instantly found and displayed. It was very simple to create. And my application runs directly from the DOS command line.

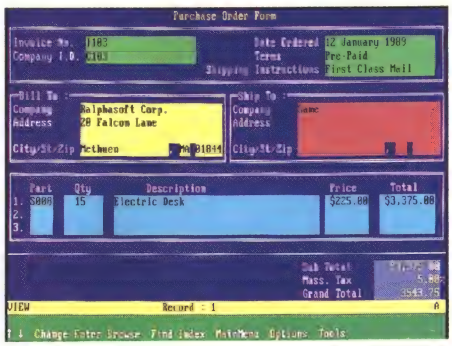


With Alpha FOUR I can create custom applications in a fraction of the time I spend with other programs. It's the fastest, easiest database program I've ever seen.

Alpha FOUR has relational capabilities too; that means it can link up to 10 databases all at one time and make it look like they are one big database. That's important because you don't want to enter data more than once. Look at the Invoice screen I made for Solar Video on this page. That's actually 3 separate databases: 1 for the invoice information, 1 for the customer information, and 1 for the tape information. If I didn't use a relational database, all that information would be in each invoice record. That would be one huge (and very slow) database. But with Alpha FOUR, I don't have to worry.

Know what I like most about Alpha FOUR? It seems every time I need something, Alpha FOUR is right there with the answer. It's always one step ahead. That's a good program. The kind that's perfect for people like you and me.

Speed, Speed, Speed, Speed — And More Speed! ...That's the big news in Version 2.1. Faster performance thanks to a new concept known as Bullet™ technology — that increases the speed of some indexes in Alpha FOUR by up to 70% over the previous version! Copy, export, global update, process reports and search faster than you ever thought possible. This Bullet technology is quite an impressive breakthrough!



*Talk about ease-of-use combined with **power** — I can relate 3 database files together for my Invoicing application. Alpha FOUR gives me what I need for serious applications.*

Data Entry Simplified — And Virtually Error Free! Streamline data entry with colorful, easy-to-follow screens that eliminate the chance of errors with Alpha FOUR 2.1 field rules. For example, Alpha FOUR 2.1 will automatically change letters from lower to upper case as you enter, or allow you to skip over certain fields unless specific conditions are met — even perform calculations automatically!

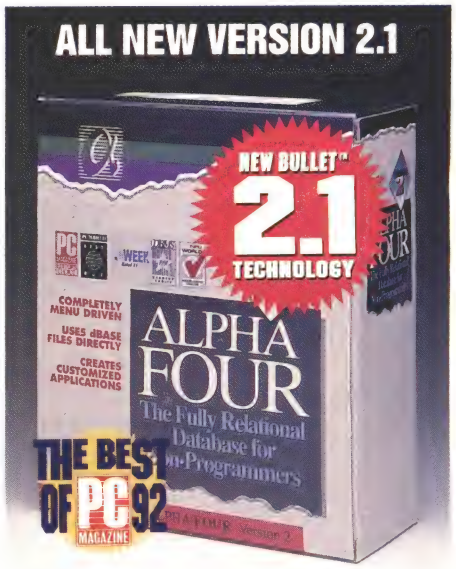
Alpha FOUR 2.1 also helps you speed data entry with a powerful look-up feature that displays possible entries for given fields — you simply select from the list to fill in the related information. For example, enter a part number and Alpha FOUR 2.1 automatically enters the corresponding description and price for you.

Totally dBASE Compatible. I was delighted to hear Alpha FOUR is totally compatible with dBASE .dbf files. Our mailing list went right into the new application without even having to be converted! And when my Alpha FOUR application grows, it'll import those Lotus 1-2-3 files used over in accounting. In fact, Alpha FOUR can import and export Lotus 1-2-3, Symphony, VisiCalc, PFS, MultiMate, WordPerfect.

Great Looking Reports Are An Alpha FOUR Specialty! I love Alpha FOUR 2.1's "What You See Is What You Get" report writer — with just a few menu selections, you can create custom screen and printed reports to fit any need: long text fields in multi-line columns with word wrapping. Or format numeric fields to print out as words for the "Pay this amount" line on your blank checks.

Alpha FOUR 2.1 also contains built-in layout editors to create professional quality (and fully customized) letters, invoices, announcements — virtually any document. Plus, with the FREE FormFiller 4.0 that we've included in this spectacular offer, you'll fill in pre-printed forms from your Alpha FOUR 2.1 database with the greatest of ease!

A Powerhouse Of Easy-To-Use Features... dBASE Compatible • Fully Relational • Menu-Driven Scripting • Over 80 Functions for Manipulating Data • Ability to Call and Pass Data to Other Programs • Instant DOS Access and more.



THE ALPHA FOUR SUPER BUNDLE

With the purchase of Alpha FOUR 2.1 you receive:

All New FormFiller 4.0 — Just released and completely redesigned! The PC is a perfect tool to help you fill in forms. With FormFiller 4.0, your computer is precisely synchronized, so filled-in data is positioned in exactly the proper place every time. A master template of the form guides fill-in, reduces change for error — even checks for accuracy. FormFiller 4.0 is the premier forms fill-in software.

AND... Zip Code Database — A complete database containing over 41,000 United States zip codes, cities and states. Maintain your mailing list with surprising ease, print labels for massive mailings, even eradicate duplicates automatically. Anyone can benefit from this handy database. Not just a lightweight add-on, this is a fully functional application — and it's yours free with Alpha FOUR.

A TOTAL VALUE OF $693 FOR JUST $99.90!

HERE'S WHAT YOU GET:

Alpha FOUR (Single User)	worth $495.00
Zip Code Database	worth $49.00
FormFiller 4.0	worth $149.00
Total Value	**$693.00**

ALL FOR JUST $99.90

ASK ABOUT
THE ALPHA FOUR SERVER UNIT
You Get TWO Extra Network LAN Packs Inside Absolutely FREE! *A $1049 Value.*
Offer subject to change without notice.

Tiger's Alpha FOUR 2.1 Super Bundle

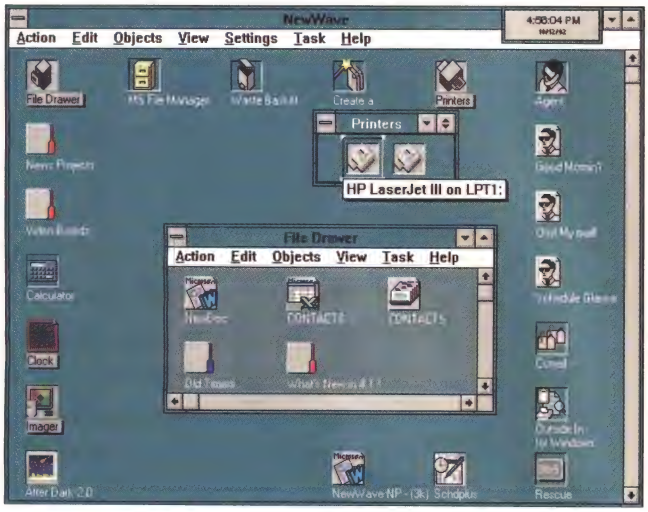
BDO3450 **Alpha FOUR Version 2.1 Non-Networkable** with FormFiller 4.0 and Zip Code Database **$99.90**

BDO3451 **Alpha FOUR Network Pack** Includes Network Server and 2 Network LAN Packs **$348.00**

Please specify diskette size when ordering.

Circle 214 on reader service card

Performance, Installation Improved in Latest NewWave



NEWWAVE 4.1 OFFERS faster performance and installation while maintaining its familiar icon-based environment.

With *NewWave 4.1*, Hewlett-Packard has trimmed down, speeded up, and generally enhanced its powerful, object-oriented desktop manager. But despite simplified installation and better tools to manage the transition, HP's application environment-turned-*Windows*-shell maintains its Himalayan learning curve. Still, it offers enough improvements that it may be worth the rocky journey from *Windows* to enjoy the program's powerful automation and file-management capabilities.

NewWave's philosophy holds that applications are simply a means to an end and that users should concentrate on data, not on the programs that manipulate it. *NewWave* replaces the familiar system of files and directories with objects and tools, creating a seamless, icon-based environment where you launch programs by clicking on the files created under them. While *NewWave* calls applications and their files *objects*, utilities that do not create and modify files, such as screen savers and the *Windows* calculator, are known as *tools*.

Faster performance and enhanced desktop operation are the key enhancements. Drag-and-drop printing now supports multiple printers and even fax machines, and creating new application files on the desktop has been simplified to a click-and-drag procedure. *NewWave* also offers fuller *Windows* integration, allowing users to open multiple files under a program and to save files created inside an application directly to the *NewWave* desktop. Finally, version 4.1 installs, loads, and operates faster than its predecessor and offers more guidance in configuring the system properly.

—Michael Desmond

NewWave 4.1

WINDOWS **HP improves its object-oriented Windows desktop manager with a friendlier interface, better setup, and snappier performance.**

Hewlett-Packard Co.
800/554-1305,
408/720-3560 (fax)
List price: $195,
upgrades $49
Reader service no. 662

Forest & Trees Reads More Data, Offers Better Interface

If you need to examine data from a variety of sources, linking and arranging it in different ways, you've probably considered buying Channel Computing's data access and reporting tool, *Forest & Trees*.

Intended for reading data but not writing it, *Forest & Trees* allows you to access a wide variety of data formats, link tables that may or may not have been designed to work together, and search on complex criteria. *Forest & Trees for Windows 3.0* adds a wide variety of functions without changing the program's fundamental look or feel.

The first question with a program like this is, Can it read your data? The new *Forest & Trees* adds EDA/SQL, Hewlett-Packard Allbase, *Excel 4.0*, and Ingres data formats to its already substantial list, which includes *dBASE, Paradox, 1-2-3*, SQL Server, and Oracle Server.

Other new features affect what you can do with your data once you've gotten it. The new reporting engine makes two passes across your data, enabling you to put totals in your report headers and aggregate expressions within your report. You can now create cross-tab reports on the fly with summary figures summarized again. New drill-down capabilities let you uncover and examine details below the generalized information. And you can define situations that will trigger actions—for instance, you can have *Forest & Trees* send a prewritten E-mail message when inventory drops below a given level.

Interface improvements let you redefine reports and views with right-mouse-button pop-up menus and adjust column width with drag-and-drop resizing. A Query Assist feature joins tables automatically and creates Group By and Where clauses.

You can define views (predefined sets of the way data is shown on screen) with buttons, bit-mapped images, and hot spots. View groups can be hidden, and you can determine the features available to each user.

Forest & Trees is $695 for the single-user version, $790 for the client server.

—Lincoln Spector

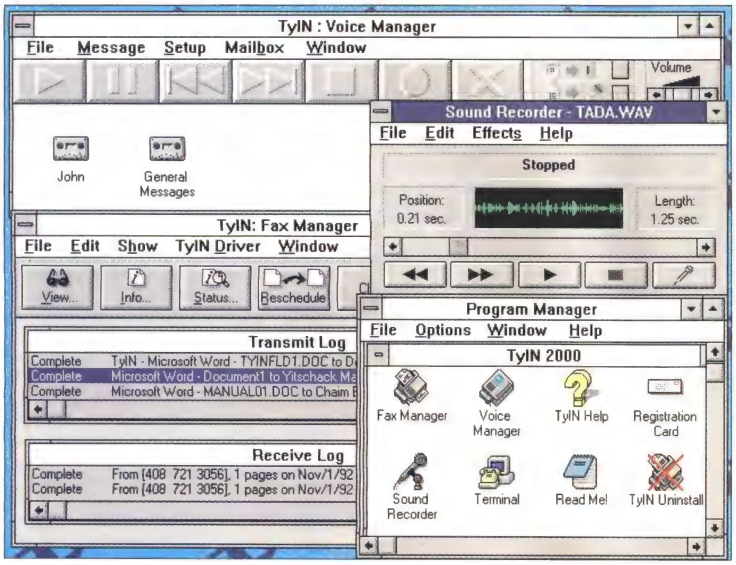
Forest & Trees for Windows 3.0

WINDOWS **The new version of this data access tool reads more kinds of data and lets you do more with it.**

Channel Computing
800/952-8779,
603/427-0385 (fax)
List price: $695
Reader service no. 663

IT WAS THE MOST SUCCESSFUL PRODUCT LAUNCH IN WINDOWS HISTORY.

TyIN 2000 Communications System Ties Data, Fax, and Voice Together



READY FOR THE HOME OFFICE: The $279 TyIN 2000 voice/fax-modem comes with Windows-based fax, voice annotation, and answering machine software.

National Semiconductor is taking a bold leap into the competitive retail modem market with its new TyIN 2000: a feature-packed fax-modem with voice capabilities and *Windows* fax, voice messaging, and answering machine software. Targeted at the growing number of small-business and home-office users who need an integrated, PC-based communications system, this PC add-in board offers a number of noteworthy features for $279. It can detect incoming voice, fax, and data calls automatically, record incoming phone calls while you're working in another application, and annotate voice messages to spreadsheets and documents.

Audio and Phone Messaging

In addition to being a standard 9600/2400-bps fax-modem, the TyIN 2000 offers a suite of tools for playing, recording, and sending voice messages. You can play back sounds through the board's integrated loudspeaker or a telephone handset or, for better sound quality, through an external speaker. To annotate business documents or to record voice messages to E-mail, you use TyIN 2000's Voice Manager software and a telephone handset or external microphone.

Audio recordings are stored in *Windows* WAV format, meaning you can send voice messages via the network or modem to colleagues who have audio-capable *Windows* PCs. The TyIN 2000 board records WAV files at 11 kHz and plays them back at 11 or 22 kHz—good enough for simple voice applications but not on a par with the 44-kHz CD-quality audio.

In addition to providing business audio, the TyIN 2000 turns your PC into a telephone answering machine. You can set up multiple mailboxes, each with a different greeting, so callers can direct their messages to the right user. Password protection ensures confidentiality, and a remote user at a touch-tone phone can call in for messages.

Compression saves hard disk space by squeezing voice messages at a ratio of better than 2 to 1, National says. (The actual ratio depends on the amount of silence in each message. National estimates that a 1-minute phone message should fill about 200K of disk space.) The TyIN 2000 board does not compress WAV files, however, since that format currently has no compression standard.

National's expertise in designing digital answering machine chips is evident in the TyIN 2000's ability to distinguish between incoming voice, fax, and data calls and switch to the appropriate receive mode. Unlike some fax-modems that require a distinctive ring service from the phone company to route calls, the TyIN 2000 does not require a distinctive ring, saving you money on your phone bill.

Fax From Windows

TyIN 2000 can send and receive faxes at 9600 bps, and it uses error correction and data compression to improve transmission. The product's Fax Manager software is fairly routine as *Windows* fax software goes, allowing you to send faxes from within applications by "printing" to the fax-modem. As with most fax software, you can create phone books of fax recipients, resend and reschedule faxes, and zoom in on fax pages for a closer look. However, the software lacks a number of the sophisticated tools for image editing, cover-page design, and character recognition found in the latest fax packages, which you might use with the TyIN 2000.

The 2400-bps data modem is fairly routine. It works with any standard communications program, including Windows Terminal, and supports V.42bis for 4-to-1 data compression. The TyIN 2000 doesn't include data communications software.

Future-Looking Design

The TyIN 2000 doesn't skimp on power. Unlike bargain modems that rely on the CPU's processing power, National's card features a powerful 32-bit processor that won't slow your machine to a crawl when you receive a fax or voice message. Furthermore, it has an integrated digital signal processor that allows you to upgrade the board through software.

National Semiconductor isn't the only player in the data/fax/voice-modem market. Both The Complete PC and Prometheus Products offer similar products, and other manufacturers are expected to add voice to their fax-modems this year. However, it'll be hard for the competition to beat the TyIN 2000's combination of advanced technology and low price.

—Jeff Bertolucci

TyIN 2000

This $279 modem integrates data, fax, and voice features on a PC add-in board.

National Semiconductor
800/538-8510,
408/721-7662 (fax)
List price: $279
Reader service no. 664

IT SWEPT ALL THE MAJOR USER SURVEYS.

Integrated Fax and Communications for Windows

For good or ill, faxes have become essential tools of modern business communications, and modems that handle both data and fax are increasingly common. The latest incarnation of *MicroPhone,* Software Ventures' workhorse communications program, gives a nod to that reality by integrating fax abilities. *MicroPhone Pro for Windows* also includes a host of new features that take the pain out of on-line communications.

The product includes *WinFax Lite,* a version of Delrina Technology's hugely successful send/receive fax software package. It's well integrated into *MicroPhone Pro for Windows;* to call up the fax module, just click on an icon.

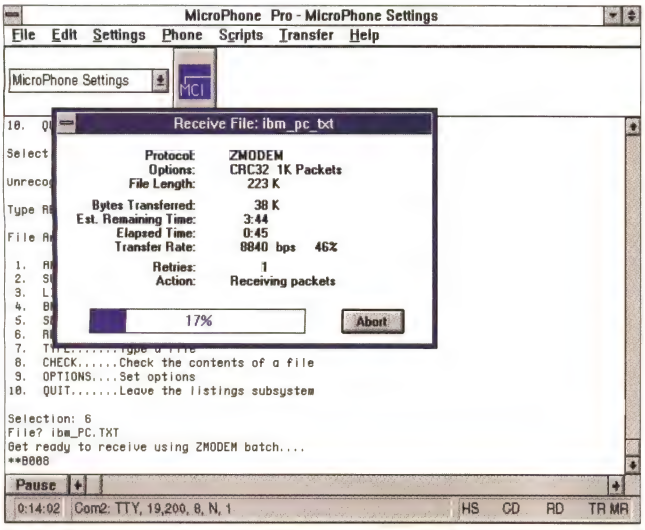
One unique feature is the program's ability to automate fax sending via an extensive scripting facility. You can write your own script, or use *MicroPhone*'s "watch me" mode to create a reusable script automatically. You can also use the fax module outside *MicroPhone Pro* to fax documents directly from any *Windows* application.

MicroPhone supports drag-and-drop in a unique way. To transfer a file while you're connected on line, you simply drag and drop its icon into the terminal window. If you want to fax the document, drop the document icon onto *MicroPhone*'s fax icon. Using *MicroPhone*'s script facility, you can set up custom icons that will send the fax automatically to one or more recipients.

If your PC is set up for multimedia, *MicroPhone Pro* has additional surprises in store. If you drop a sound or picture file onto *MicroPhone Pro*'s multimedia icon (a cassette), you'll hear or see the message.

MicroPhone Pro for Windows' straightforward user interface has an uncluttered basic screen and is a breeze to understand. The program retails for $195.

–Stan Miastkowski



MICROPHONE PRO FOR WINDOWS' elegantly simple user interface is the door to a host of advanced fax and communications features.

MicroPhone Pro for Windows

WINDOWS The latest version of a workhorse communications program includes fax capabilities and numerous new Windows-specific features.

Software Ventures Corp.
510/644-3232,
510/848-0885 (fax)
List price: $195
Reader service no. 665

Multiport I/O Board Saves Bus Slots

If your PC runs multimedia, scientific, or industrial applications, you've probably found the I/O bus slot a precious resource. Hook up an additional printer, tape and floppy drives, scanner, bar-code reader, digitizer, mouse, and modem, and suddenly you've got too many I/O cards and not enough slots.

One solution is the Port-Folio 550, a 13-port I/O board from Quickpath Systems that lets you connect multiple peripherals to a single AT-bus card. Featuring four serial, four floppy, two parallel, one game, and two IDE ports, this multiport board can handle two printers, four 1.2MB or 1.44MB floppy drives, two IDE drives, a joystick, and four serial devices (such as modems and mice) simultaneously. This means you can fill free I/O slots with network, video, audio, SCSI, memory, and other boards.

In addition to freeing up valuable AT-bus slots, the Port-Folio 550 offers special benefits to *Windows 3.1* users, thanks to four high-speed UART chips, which control the communications ports. Each is equipped with a 16-byte buffer designed to speed communications multitasking and reduce data errors. As a result, *Windows 3.1* users can more reliably download files from a BBS while working in a spreadsheet, for example.

The Port-Folio 550 isn't for novices. The board comes with a daunting array of cables and brackets to connect multiple peripherals—intimidating for the beginner. Also, the product lacks a software diagnostic program to detect I/O conflicts during installation. On the plus side, Quickpath Systems includes software drivers for four floppies in case your PC's BIOS doesn't already support them. Also helpful is an easy-to-read diagram card that identifies the Port-Folio's 13 ports and supplies setting and address information for each.

The Port-Folio 550 has a list price of $149, with street prices as low as $120, according to Quickpath Systems.

–Jeff Bertolucci

Port-Folio 550

Multiport I/O bus board lets you connect multiple peripherals to a single AT-bus slot.

Quickpath Systems
800/995-8828,
510/440-7289 (fax)
List price: $149
Reader service no. 666

AND IT MADE A LOT OF PEOPLE IN REDMOND, WASHINGTON VERY UNHAPPY.

Smart Label Printer Pro

Label printers may not be the most exciting peripherals, but they are among the most popular. Why? Just ask your local administrative assistant. Printing labels for envelopes and file folders, an everyday office task, is surprisingly difficult on standard office printers. Seiko Instruments, a major player in the label printer market, recently introduced an upgraded version of its leading product, the Smart Label Printer.

The new Smart Label Printer Pro adds support for wider labels. You now have your choice of labels for 3½-inch disks and shipping or name tags. Seiko has also improved the printer's speed (up to ten labels per minute) and the quality of its thermal output (you can, for example, print scanned-in photographs on name tags). In addition to the hardware improvements, Seiko is shipping new versions of its *Windows* and DOS TSR software, both of which can capture addresses on the fly from letters and route them automatically to the Smart Label Printer Pro. Smart Label Printer Pro (*Windows*/DOS version) $299.95; Smart Label Printer Plus (DOS-only) $199.95. Seiko Instruments, 800/888-0817, 408/433-3206 (fax).

Reader service no. 672

Micrografx ABC FlowCharter 2.0, Micrografx Windows OrgChart 2.0

WINDOWS In its first upgrade in three years, Micrografx's *ABC FlowCharter 2.0* adds a host of new tools for visually representing data flow, network layouts, manufacturing steps, and other processes. You now get a choice of palettes with industry-standard shapes as well as the ability to mix and match shapes between palettes and to import graphics via *Windows'* Clipboard. Version 2.0 lets you link one flowchart to several others, so you can create charts for each part of a complex process and leap from one part to the next. The $495 *FlowCharter* comes with 14 TrueType fonts, and OLE support lets you embed charts in other *Windows* applications.

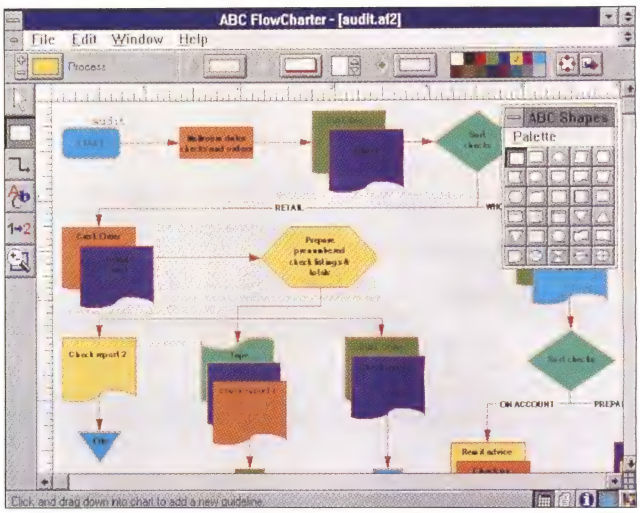
Windows OrgChart 2.0 adds tools that make it easier to create sharp-looking organizational diagrams. Simply draw one box, and add equal or subordinate boxes by clicking on directional arrows. You can attach notes or image files to each box and call up the data with a mouse click, mix different typefaces within each box, and print full-color charts with custom borders and drop-shadow effects. *OrgChart 2.0* retails for $149.95. Micrografx, Inc., 800/733-3729, 214/234-2410 (fax).

Reader service no. 673

CG-8000 ColorArtist Pro

Mustek's CG-8000 ColorArtist Pro is a hand-held color scanner that delivers 24-bit color images at up to 800-dpi resolution and complies with all three TWAIN formats. You can switch between 24-bit and 12-bit color and scan 256 colors or 16 degrees of gray, as well as halftone images and line art, at resolutions from 100 dpi up to an interpolated resolution of 800 dpi. For the list price of $599, you also get Micrografx's *Picture Publisher 3.1 LE, Perceive Personal Omnifont OCR* from Ocron, and *Mustek Slideshow*. Mustek Inc.; 714/833-7740, 714/833-7813 (fax).

Reader service no. 674



GOING WITH THE FLOW: Micrografx ABC FlowCharter lets you create flow diagrams from predesigned palettes of industry-standard shapes.

Bernoulli MultiDisk 150

With the Bernoulli MultiDisk 150, Iomega delivers fast, removable-disk mass storage to PC users. MultiDisk 150 list prices start at $1099; the unit comes in portable, internal, and dual-drive configurations. Supporting 35MB, 65MB, 105MB, and 150MB removable disks, it is the first Bernoulli drive to handle disks of various capacities, while its 19ms average access time means you get hard-drive–like performance. The 150 is also an attractive upgrade for Bernoulli users since it reads and writes to older Bernoulli 90 disks and can read from Bernoulli 44 disks. Iomega, 800/777-6179, 801/778-3450 (fax).

Reader service no. 675

IronClad 2.0

WINDOWS Assuring network security without locking out users is a real challenge. But *IronClad 2.0,* a $195 program from Silver Oak Systems, protects, maintains, and tracks file sharing on dedicated standalone and networked PCs without restricting access. *IronClad* includes standard security features, such as multilevel password access, file locking and encryption, and limited virus protection. But *IronClad* also protects users' system configurations and prevents hard drive tampering while maintaining full access to programs and data. Designed to support both *Windows* and DOS, *IronClad* provides file auditing and an automated disk management routine that purges unwanted files at specified intervals. Silver Oak Systems, Inc., 301/585-8641, 301/588-6484 (fax).

Reader service no. 677

Halo Desktop Imager

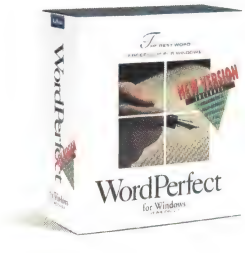
Halo Desktop Imager has entered the ranks of bona fide image editors, according to its developers at Media Cybernetics. It boasts a host of retouching tools, an image gallery, and color separation capability. Lacking only the ability to do masking, the retouching tools include a special-effects brush that softens, sharpens, blends, or scrambles. You can clone or paint with any image. The erase brush has a partial undo feature that allows you to unpaint select

INTRODUCING WORDPERFECT® 5.2 FOR WINDOWS. No software product — not even Windows itself — has ever gotten off to a faster start than WordPerfect® for Windows. Now, one year and 1.9 million copies later, WordPerfect

BUT WE COULDN'T LEAVE WELL ENOUGH ALONE.

offers advanced new features like zoom edit and drag and drop text, includes support for DDE and OLE, and is mail-enabled. We've souped up the spellchecker and built in Grammatik™ 5, the industry's best-selling grammar tool. We've included Adobe Type Manager™ and 12 new fonts. And we've come up with a few innovations you'll find nowhere else: QuickFinder, a versatile indexing and text retrieval system, and QuickMenu, a one-click shortcut to customized Button Bars™ (several new Button Bars and macros are shipping with the product).

But we haven't changed — or forgotten — what's made WordPerfect the sales leader. Release 5.2 is still fully file-compatible with WordPerfect 5.1 for DOS and Windows. And it's still backed by the best toll-free technical support in the business. For upgrade and competitive trade-up information, please call (800) 526-5198. As always, our operators are standing by.



WordPerfect®

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The power to mo
Not to mention

e mountains. the CEO.

Introducing the ultimate in peak performance. Four new IBM Ultimedia™ systems that are part of the broadest and most powerful line of multimedia computers available.

Feature / Model	Processor/ Speed	Hard Drive	Memory	Integrated Front Audio Panel
M57 386 SLC™	386 SLC 20 MHz	160MB	8MB expandable to 16MB	Yes
M57 486SLC2	486SLC2 50/25 MHz	212MB	8MB expandable to 16MB	Yes
DV M57 486SLC2	486SLC2 50/25 MHz	212MB	8MB expandable to 16MB	Yes
M77 486	486 SX 33 MHz	212MB	8MB expandable to 32MB	Yes
M77 486DX2	486DX2 66/33 MHz	212MB	8MB expandable to 32MB	Yes

Full-fledged PS/2®s that can also run hundreds of multimedia-enabled applications already out there. And thousands more to come.

Our newest systems offer integrated multimedia functions for a variety of individual, departmental and enterprise-wide uses. There are Ultimedia systems for everything from corporate training and presentations to adding basic audio and video to spreadsheets, E-mail and a range of business applications. They're easy to install and use, compatible with most existing hardware and software, and easily connected into most existing networks. And since they're fully integrated, ready-to-run systems, IBM Ultimedia is a cost-effective way to harness the power of multimedia.

All new Ultimedia systems are upgradable and expandable, support CD-ROM XA titles and come with a CD library of applications and demos. OS/2® 2.01, MMPM/2, DOS 5.0 and Windows™ 3.1 are pre-installed. And all new models are backed by HelpWare™—a range of service and support that's king of the hill, with a three-year, on-site warranty and more.

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NO. OF MODULES	9	1	9
NETWORK CAPABLE	YES	NO	YES
POINT-OF-SALE CAPABLE	YES	NO	YES
AVERAGE PRICE PER MODULE	$22.22	$49.95	$695.00

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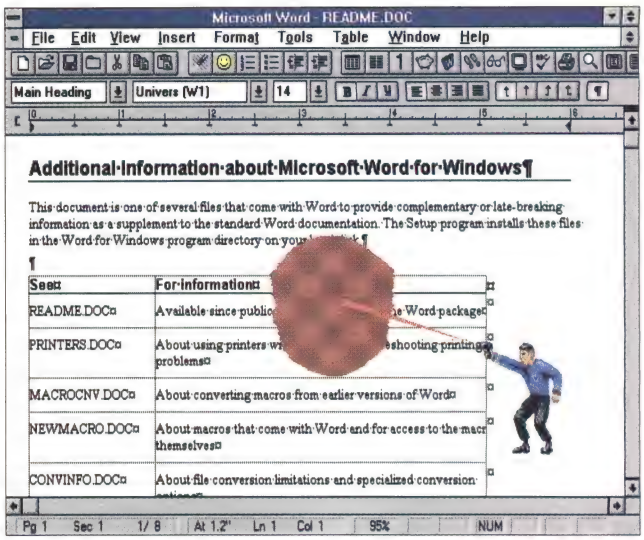

WHERE NO SCREEN SAVER HAS GONE BEFORE: Star Trek—The Screen Saver includes images and sounds from the original TV series.

layers of the image. The gallery provides thumbnail views of your images to simplify finding files. You can also copy, rename, delete, and open files from the gallery. A surprise in a $169 program is the capability to do color separations. *Halo Desktop Imager 2.0* supports TWAIN, OLE, and Kodak Photo CD. Media Cybernetics, Inc., 800/992-4256, 301/495-5964 (fax).

Reader service no. 685

PCMCIA Notebook FAX/Modem Model CC2144

Designed for the PCMCIA card slots that are becoming common in the new generation of notebook and palmtop computers, Megahertz's 14,400-bps PCMCIA Notebook FAX/Modem Model CC2144 squeezes high-speed communications and fax capabilities into a full-featured, credit card–size package. Compliant with the V.42bis standard, the unit lets you use compression and error correction to send and receive data at up to 57,600 bps. Faxes can travel at up to 14,400 bps. The device includes its own power conservation mechanism and is cellular-telephone ready, provided you bring the optional cellular interface. Listed at $699, the PCMCIA FAX/Modem includes a custom cable and is warranted for five years. Megahertz Corp., 800/527-8677, 801/272-6077 (fax).

Reader service no. 679

Star Trek–The Screen Saver

WINDOWS From the folks who brought flying toasters to the PC comes *Star Trek–The Screen Saver,* a $59.95 *Windows* package featuring a host of images and sounds from the original television series. Part of Berkeley Systems popular *After Dark* series, *ST-TSS* includes scenes from *Star Trek* episodes, schematics of the Enterprise, and some timeless sound bits. Berkeley Systems, Inc., 800/877-5535, 510/540-5115 (fax).

Reader service no. 678

Amaze Daily Planners

WINDOWS Amaze Software's new *Daily Planner* helps you get through the workday with a good sense of humor. Version 2.0 comes with three

theme packs: *Trivial Pursuit Genius and Sports Edition*, *Far Side Volume II*, and *Cathy*. The *Cathy* edition offers a new comic strip every day with laughs for those who, like Cathy, know the four basic guilt groups: food, love, mother, and career.

If that hits too close to home, try the *Far Side* version; new animation brings animals to life when you least expect it. The *Trivial Pursuit* edition asks a new question every day and keeps score all year long—so try to avoid answering questions in the geography category.

The calendars show your schedule by day, week, or month. New features include a tool bar for basic functions, a to-do list, and an alarm that can be programmed to sound minutes or hours before an important event. The planners are available in DOS and *Windows* versions, and you can also run the new theme packs on *Daily Planner 1.0*. List price is $69.95; individual theme packs are $24.95. Amaze Inc., 800/395-1546, 206/820-7007.

Reader service no. 676

RangeLAN/PCMCIA

Portable computers should be portable, not tied down with wires and cables. Proxim's RangeLAN/PCMCIA gives any mobile PC with a PCMCIA slot a wireless local connection to the corporate LAN. Simply plug the device into the slot and attach a short, flexible antenna. For the network server, Proxim offers a receiver/transmitter on an ISA add-in card with an external antenna.

The RangeLAN/PCMCIA employs spread-spectrum radio technology with error correction and can communicate with a file server at 242 Kbps. It can communicate with the server over "several hundred feet" within buildings and across 800 feet in the open. Drivers for Novell NetWare *2.x*, *3.x*, and *NetWare Lite* are included. The RangeLAN/PCMCIA sells for $595. "Roaming" software that lets you communicate with multiple LAN servers is $99. Proxim, Inc., 800/229-1630, 415/964-5181 (fax).

Reader service no. 680

NCR 3130 NotePad

NCR's second-generation pen PC, the 3130 NotePad, features a backlit screen with an improved 13-to-1 contrast ratio. Other new features include a PCMCIA card slot for an internal fax-modem, a LAN adapter, flash memory, and other cards. Choose between an internal 40MB or 60MB hard drive or a 20MB flash memory PCMCIA card. An additional bay can be used to house either an internal fax-modem or a second PCMCIA slot.

At 4.7 pounds, the NotePad 3130 is slightly thicker and ½-pound heavier than the NotePad 3125 but retains the earlier model's 20-MHz 386SL processor. It comes with your choice of four operating environments installed: *Windows for Pen Computing*, Penpoint, PenRight, or PenDOS.

List priced at approximately $3697 (depending on configuration), the NotePad 3130 is designed for mobile workers in professions such as health care, real estate, and field sales. NCR Corp., 800/225-5627, 513/445-5552 (fax).

Reader service no. 681

For more information about any product, contact the manufacturer or circle the number on the reader service card.

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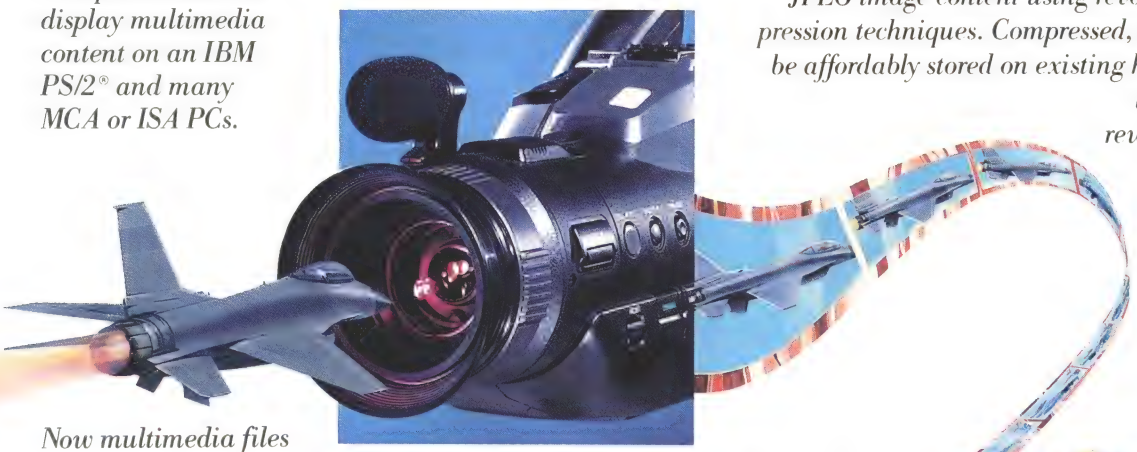

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ActionMedia II won "Best of Comdex/Fall '91" and was recently named "Development Product of the Year" by CD-ROM Professional Magazine.

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Circle 125 on reader service card

Marketplace

A Monthly Survey of Prices on Popular Models

Over the Counter

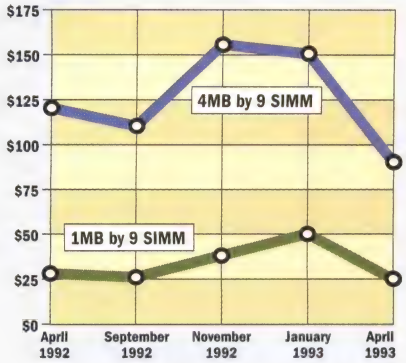
What you pay at retail stores for popular PCs

	Configuration			National	
	CPU/speed (MHz)	RAM (MB)	Hard disk (MB)	List	Average
386SX/SLC-based desktop PCs					
AST Power Premium 3/25s	i386SX-25	2	80	$1845	$1580
Dell 333s/L	i386SX-33	4	120	$1200	$1200
Gateway 2000 3SX-25	i386SX-25	4	80	$945	$945
IBM PS/2 Model 56 SLC	386SLC-20	4	80	$1475	$1260
NEC PowerMate SX/25i	i386SX-25	2	60	$1299	$1102
386DX-based desktop PCs					
AST Power Premium 3/33	i386DX-33	4	210	$3095	$2654
Compaq Deskpro 3/33i	i386DX-33	4	120	$1979	$1836
Compaq Deskpro 386/33M	i386DX-33	4	120	$2569	$2325
Hyundai CS-386/40	Am386DX-40	4	120	$1730	$1730
486SX-based desktop PCs					
AST Power Premium 4/25s	i486SX-25	4	210	$2995	$2605
Compaq Deskpro 486s/25M	i486SX-25	4	120	$2569	$2305
DEC DECpc 425sx LP	i486SX-25	4	245	$1849	$1849
Dell System 486D/25	i486SX-25	4	200	$1920	$1920
Dell System 425SE	i486SX-25	4	200	$3570	$3570
Hyundai 433SP	i486SX-33	4	120	$1459	$1459
IBM PS/ValuePoint 425SX	i486SX-25	8	170	$1357	$1357
486DX-based desktop PCs					
AST Power Premium 486/33	i486DX-33	4	210	$3495	$3025
Compaq Deskpro 486/33M	i486DX-33	4	340	$3869	$3461
Compaq Deskpro 50M	i486DX2-50	8	340	$4469	$4036
DEC DECpc 466d2 LP	i486DX2-66	4	120	$2199	$2199
Dell 486D/66	i486DX2-66	8	230	$2850	$2850
Gateway 2000 4DX2-66V	i486DX2-66	8	340	$2425	$2425
IBM PS/2 Model 90 XP-OLF	i486DX2-50	8	400	$5020	$4481
IBM PS/ValuePoint 433DX	i486DX-33	8	212	$2199	$2199
NEC PowerMate 486/50i	i486DX2-50	4	240	$2949	$2534
Portable PCs					
AST PowerExec 3/25SL	i386SL-25	4	80	$2395	$2197
Compaq Contura 3/25	i386SL-25	4	120	$2099	$1936
Compaq Portable 486c	i486DX-33	4	120	$6199	$5630
Dell 320SLi	i386SL-20	2	80	$2169	$2169
Dell NL25	i386SL-25	2	80	$1649	$1649
Gateway 2000 HandBook	F8680	1	40	$1295	$1295
Gateway 2000 Nomad 420SXL	i486SX-20	4	80	$1995	$1995
Hyundai Courier Spectra	486SLC-25	4	120	$2999	$2999
IBM PS/2 Model N51 SLC	386SLC-16	2	80	$2265	$1910
IBM *ThinkPad 700*	486SLC-25	4	80	$2750	$2557
NEC UltraLite SL/20	i386SL-20	2	80	$1999	$1719
TI TravelMate 4000WinDX	i486DX-25	4	120	$3299	$2938
Toshiba T3300SL	i386SL-25	2	80	$2299	$2041
Zeos Pocket PC	V30-10	1	none	$595	$595
ZDS Z-Note 325Lc	i386SL-25	4	120	$4625	$4625

From a national survey of more than 180 dealers by International Data Corporation. Figures are based on at least four price quotes for each machine. Prices are based on manufacturer's standard configuration without monitor.

SIMM Prices Expected to Drop

But first, tariffs on chips will boost prices

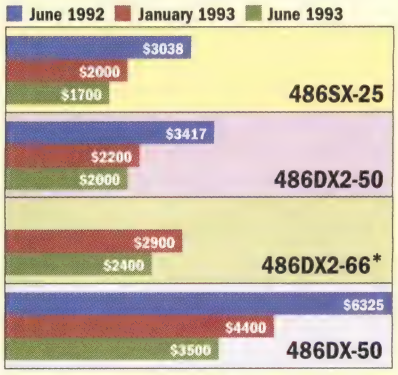


Average single-order street prices for 80-nanosecond SIMMs should drop to record lows if a tariff on Korean-made chips is reduced in March as Ronald Bohn, senior industry analyst with Dataquest, expects. Though the cost of SIMMs fell steadily during much of 1992, U.S. tariffs imposed on Korean-made chips in late October increased retail prices. But prices may fall in late spring, says Bohn. Prices are in flux, he says, because the tariff is under review, with a final ruling from the U.S. Commerce Department expected by March 15.

Source: Dataquest

486 Price Cuts to Come

Dramatic drops in average street prices



New CPUs from Cyrix, AMD, and Intel will bring price cuts of up to $900 on 486-based systems this spring, says International Data Corporation pricing analyst Brian Clarke. Among the upcoming processors: Intel's Pentium chip should be available by April, Cyrix was expected to introduce a 486DX2-type chip at press time, and AMD should deliver new 486 products soon thereafter. Price declines on 486DX-50s should be the most dramatic as vendors create a new price point for Pentium systems, expected to list from $4000 to $6000.

*Chip not available in June 1992

Source: International Data Corporation

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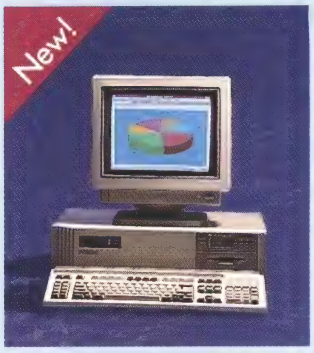

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- 1.2MB or 1.44MB floppy drive
- 14" SVGA color monitor with 1MB local bus video card
- Northgate 101-S keyboard

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- Six 32-bit EISA bus master slots
- 128K adaptive write-back cache; expands to 256K
- 4MB RAM; expands to 128MB
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- 1.2MB or 1.44MB floppy drive
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- Six 32-bit EISA bus master slots
- 128K adaptive write-back cache; expands to 256K
- 4MB RAM; expands to 128MB
- 200MB hard drive
- 1.2MB or 1.44MB floppy drive
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- 1.2MB or 1.44MB floppy drive
- 14" SVGA color monitor
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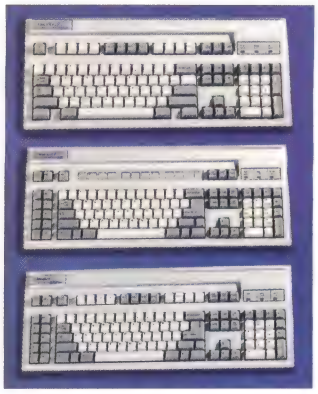

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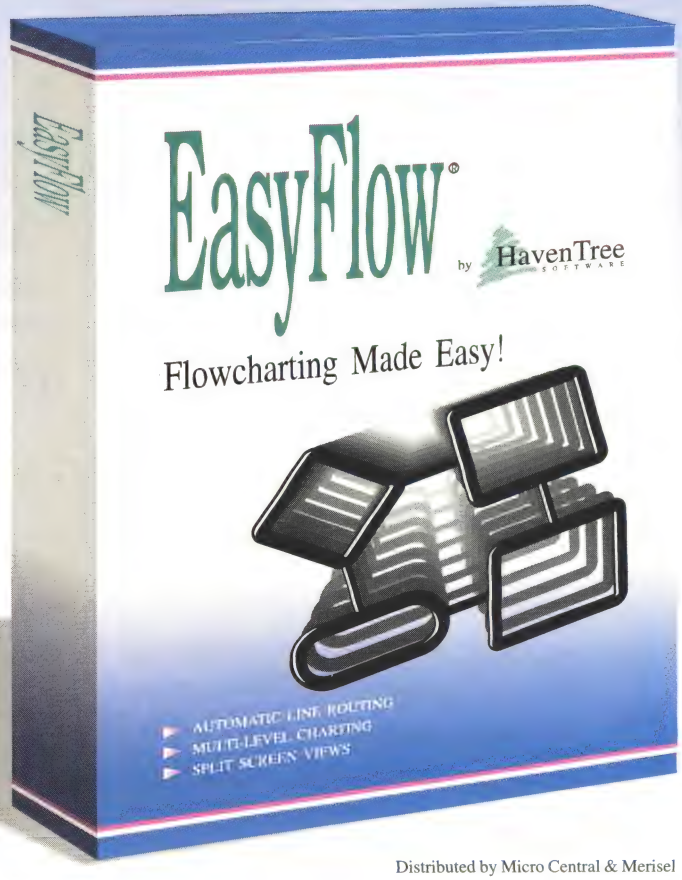

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Circle 91 on reader service card

25 New 486s: The Quest

486-based computers are the desktop systems of choice for mainstream business use these days, and with good reason. They're powerful enough to handle the most demanding applications and affordable enough to be in step with today's belt-tightening budgets. So the question for most business buyers is not *whether* to buy a 486, but *which* 486 is right for their needs and means.

That question has never been harder to answer. While buyers may dream about owning the fastest PC possible, when it comes time to dig into their wallets, they just want the most PC for their money.

Is a $1500 25-MHz 486SX a better value than a 50-MHz 486DX2 costing $2800? If a DX2-66 is 70 percent faster than a DX-33, how much more should it cost? How do products from Cyrix and IBM compare to their Intel counterparts? And after figuring out which processor is best, how does a buyer go about finding the best machine?

We don't claim to have the answers for every buyer. Yet we figured we could shed some light on the subject by taking a critical look at 25 systems using seven of the most popular desktop processors on the market today: the 25-MHz 486SX, 33-MHz 486DX, 50-MHz 486DX2, and 66-MHz 486DX2 from Intel; the 25-MHz 486SLC and 33-MHz 486DLC from Cyrix; and the 40-MHz 486SLC2 from IBM. We had two goals. First, we wanted to find out which processors offer the best price/performance ratios. Second, we wanted to do a "Best of" roundup to find out which of the top systems from recent reviews are the best all around.

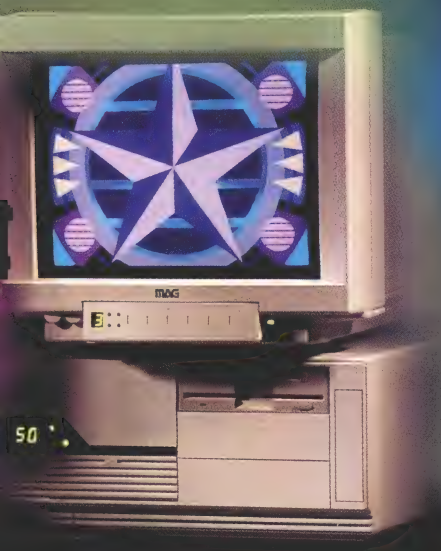
The Cream of the Crop

To pick the players for this All-Star game, we culled winners from previous *PC World* reviews. We selected Best Buys and near Best Buys from our June 1992 look at 33-MHz 486DXs, our October 1992 roundup of 50-MHz 486DX2s, and our November and December 1992 reviews of 25-MHz 486SXs. For the 66-MHz 486DX2s (a DX2-66–only review will appear in our March issue), we went to vendors whose systems were not included in the 486SX-25, 486DX-33, or 486DX2-50 groups mentioned above. Then we gathered together as many systems as we could find that use Cyrix's 486SLC-25 and 486DLC-33 processors. Finally, we ordered systems based on the IBM 486SLC2-40 from the two vendors currently selling them: IBM (see

AST's Bravo 4/66D Model 123B, Acma's 486DX2/50, Zeos's 486DX-33, Acer's AcerPower 486e DX2/50 Model 5557, and Tangent's Model 450ix: Our five Best Buys are fast, affordable, and have top-notch service and support.

MARC SIMON

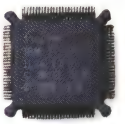
for the Best PC



Everyone knows 486 PCs deliver the best performance for the price. But which flavor of 486 to buy? We test 25 winning PCs from seven 486 classes to find the hottest 486 ever.

By Rex Farrance and Dan Miller

The CPU Contestants



IBM 486SLC2-40

Cyrix 486SLC-25

Intel 486DX-33

Cyrix 486DLC-33

Intel 486DX2-66

Intel 486SX-25

Intel 486DX2-50

"IBM: The Next Generation") and Reply. We would have loved to have included systems using the new Intel 486SX-33s and Cyrix's 486DLC-40 and 486S2-50, but none of those units were available in time for this review.

The first thing we looked at was price. As always, we base our price evaluations on what a system really costs, either at a local dealer or by mail order—not manufacturers' list prices. We priced each system with 8MB of RAM, two floppy drives (unless noted), a 100MB or larger hard disk, super VGA and a color monitor, DOS 5.0, *Windows 3.1*, a keyboard, and a mouse.

The CPU isn't the only system component that affects price. Some of these systems have bigger hard drives than others; some have better monitors. But within each group, these differences cancel each other out, so the overall prices we gathered should be representative of the "average" system in each processor class.

The two least expensive systems we found were the 486SLC2-40 from Reply and the 486SLC-25 from CompuAdd Express. After that it was a free-for-all. SX-25s and Cyrix DLC-33s ran from just under $1700 to just over $2400, while most of the DX-33s cost about $100 more. DX2-50s ran from about $2100 to $2500, and DX2-66s from around $2400 to $3200. With the exception of the DX2-66s, each step up in processing power costs an average of $150 to $300. Not that there aren't exceptions: One SX-25 cost just $8 less than one of the DX2-66s.

Best Buys

In this review, versatility counts. None of the top five systems for price made it to our top five overall. However, the top five are, for the most part, affordable (strangely enough, a DX-33, the $2844 Zeos, is the most expensive of the five). All five Best Buy systems—three DX2-50s, a DX2-66, and a DX-33—are fast, but only two of them ranked among the five fastest systems. All the Best Buys offer excellent customer service. Expandability and design are the final ingredients: adjustable clocks, sockets for future upgrade chips, and plenty of bays and slots will help these systems keep their value into the future.

1. **Acer AcerPower 486e DX2/50 Model 5557** (page 120)
2. **Acma 486DX2/50** (page 121)
3. **Tangent Model 450ix** (page 139)
4. **Zeos 486DX-33** (page 140)
5. **AST Bravo 4/66D Model 123B** (page 122)

OUR OVERALL WINNER: Acer's AcerPower 486e DX2/50 Model 5557.

See How They Run

After pricing these systems, we subjected each of them to the most comprehensive series of application tests the PC World Test Center has ever done, including our new *Windows* benchmarks and the new BAPCo test suite, which simulates typical user sessions in ten popular business applications (for details, see the PC World Test Center Report).

When the results were in, we weren't too surprised by what we saw at the top of the performance charts. The DX2-66s were by and large faster than the DX2-50s, which in turn were faster than the DX-33s. The 66-MHz DX2s from AST, Compaq, Dell, and DEC were the four fastest machines in the review, followed by the DX2-50 from Acer.

In the bottom half of the speed rankings, however, speed distinctions became much less predictable. Systems using the Cyrix 486DLC-33, the IBM 486SLC2-40, and the Intel 486SX-25 overlapped considerably from 15th to 25th place on our charts. The CompuAdd Express, the only system to use the 25-MHz Cyrix 486SLC, placed next to last overall only because the PC Brand, which beat it soundly in *Windows*, bombed the BAPCo suite.

Why the differences in performance from CPU to CPU? With the Intel processors, the answer is obvious: They are essentially the same chip running at different clock speeds. The 486DX CPUs process at the speed of the system clock, whereas the DX2 models process at double speed. All provide a 32-bit data path and an 8K internal RAM cache. All except the 486SX also offer built-in functional math coprocessors.

The non-Intel processors are very different animals—they have a 486-style or augmented 386 core in 386SX and 386DX packages to enable system manufacturers to pump up their 386 designs. The Cyrix 486SLC and the IBM SLC2 use a narrow 16-bit data path; the Cyrix 486DLC uses a 32-bit data path. The SLC2 has a big 16K internal RAM cache, the DLC and the SLC have a tiny 1K cache. Both Cyrix chips process at system speed (33 MHz for the DLC and 25 MHz for the SLC), while the SLC2 is a clock doubler chip, which means the 20-MHz version we looked at processes data at 40 MHz. Finally, neither of the Cyrix chips nor the IBM SLC2 has a built-in floating-point (fractions) math coprocessor (Cyrix does, however, sell inexpensive coprocessors); all three use hardware to speed up integer processing.

In real life, the design differences between the SX-25, the Cyrix

DLC-33, and the IBM SLC2-40 average out so that all three are roughly comparable in performance. The Cyrix SLC-25 is the slowest of the bunch.

Each Intel chip, from the SX-25 to the DX2-66, is between 30 and 50 percent faster than the one before it. In our tests, those CPU speed gains translated to system performance gains of 15 to 30 percent. That's because things like the amount of RAM and secondary (external) memory cache and the speed of the hard drive and video controller all affect overall performance. We leveled the playing field as much as possible by ordering all the systems with 8MB of RAM. Some hard drive models were more common than others, but we discerned no correlation between a specific drive and overall performance. Every system was equipped with some kind of graphics accelerator. The only component that had a noticeable effect on performance, besides the CPU, was external RAM cache; within a given processor class, systems with more RAM cache tended to be faster than those with less.

Price/Performance Equals Value

Now that we had price and performance ratings in hand, we were able to compare the different processor groups to discover which one currently offers the most bang for your buck.

As shown in the price/performance scatter chart (see "How the Chips Fell"), we plotted the average overall performance rating for each processor class against its average price. We found that the DX2-50 offers the best price/performance in the review; however, the ratings for the SLC2-40, DX-33, and DX2-66 are virtually equal to the DX2-50's. Keep in mind that the SLC2-40 scores are based on just one machine.

Another way to look at the price/performance issue is to think about the premium you'd pay for jumping from a slower CPU to a faster one. The DX2-66s we reviewed offered an average 13 percent performance boost over the DX2-50s, but they cost an average of 27 percent more. On the other hand, the average DX2-50 offered a 13 percent speed boost while costing just 6 percent more than the average 33-MHz 486DX. Finally, the DX-33s were 37 percent and 30 percent faster than the SX-25s and Cyrix 486DLC-33s, but are only 9 percent and 13 percent more expensive on average. Using this approach, the DX2-50s and DX-33s turn out to be excellent deals.

We've found that 486SX-25 systems are a better value when upgraded with an OverDrive chip; upgraded SX-25s might very well rival the DXs and DX2s for overall value. Removing the poky PC Brand from the DLC group raises their average price/performance and makes them, as a class, a better buy. The DLCs would, in fact, be very good buys if they were priced as low as the Reply SLC2, around $1600.

Service Aimed to Please

Our next goal, after finding out which CPUs offered the best value, was to find out which machines from this all-star group were the best buys. Along with price and speed, we factored in customer service, upgradability, and design.

To check service, we placed a series of anonymous calls to each vendor's tech support line, posed questions relating to typical customer problems, and rated the answers on the basis of responsiveness, courtesy, accuracy, and thoroughness. We also rated each com-

Best Price

The five least expensive systems in this review cost under $1700. If you've been reading computer ads lately, that may not seem so low. But remember, we price these systems with real-world configurations: 8MB of RAM, two floppy drives (unless noted), a 100MB-plus hard drive, super-VGA video, a color monitor, a keyboard, a mouse, DOS 5.0, and *Windows 3.1*.

1. **Reply Model 16 486SLC2** (page 138)
2. **CompuAdd Express 425CX** (page 127)
3. **Copam 486SXB/25** (page 130)
4. **PC Brand Leader 486/DLC** (page 138)
5. **Micro Express ME 486DLC** (page 135)

Best Performance

No big surprise here: The DX2-66s are the fastest systems around. But what makes some 66s faster than others? And what puts one of the DX2-50 systems into the top five? It's not the components that make a great system—it's how you put them together.

1. **AST Bravo 4/66D Model 123B** (page 122)
2. **Compaq Deskpro 4/66i Model 120** (page 126)
3. **Dell 486D/66** (page 130)
4. **DEC DECpc 466d2 LP** (page 130)
5. **Acer AcerPower 486e DX2/50 Model 5557** (page 120)

Best Service and Support

Customer support has been improving throughout the PC industry over the last year or so, and it shows in this review. Most systems here offer on-site service, fast turnaround on repairs, and long tech support hours. These five machines stand out from a generally good crowd by offering more of everything.

1. **Austin 486/DLC-33** (page 126)
2. **USA Flex 486/33 Cache** (page 140)
3. **Micro Express ME 486DLC** (page 135)
4. **DEC DECpc 466d2 LP** (page 130)
5. **Acma 486DX2/50** (page 121)

pany on the length of the system's warranty, the cost (if any) of on-site service, and the turnaround policy for returning systems that need off-site repairs.

Generally, there's good news about service and support: Customer service is improving significantly throughout the PC industry. On a scale from 1 to 100, all but one of these systems scored over 80.

Upgrade Options With Tomorrow in Mind

One way or another, most of these systems can be upgraded to a faster CPU. Some of them—including three that don't use Intel CPUs—have sockets ready for Intel's OverDrive chips. Others require you to remove the original CPU and install a new one; these systems also require you to change the system clock speed by changing either jumpers or switches. Still others put the CPU on a replaceable board; if you want to upgrade, you have to order a new board from the vendor—unless it's a an SX-25 or a DX-33, in which case you can upgrade with an OverDrive chip. Since the CPU-board option is the most expensive, we awarded fewer points for it in adding up the expandability scores.

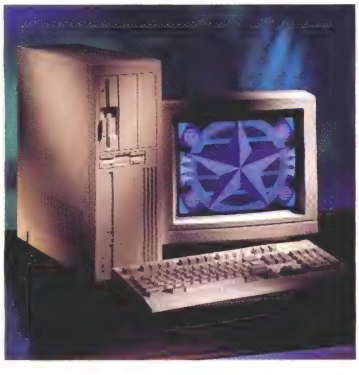
While you might think the 66-MHz 486DX2s are nonupgradable—they're already the fastest systems you can buy—two of them (from Acer and Zeos) are equipped with 238-pin CPU sockets that are designed to accept the next generation of Intel upgrade processor, which is reportedly based on Intel's new Pentium technology. In any case, we didn't penalize the other 66-MHz machines for having no CPU upgrade path.

CPUs aren't the only thing you may want to upgrade. That's why you need enough expansion slots to accommodate future peripherals and enough bays to fit new drives. There was a huge variation in expandability: The 486SX-25 tower system from ALR, for example, has a whopping ten expansion slots; the compact Compaq, DEC, and Hewlett-Packard models have just three. The ALR has an amazing 12 drive bays, while the HP has only 2. Before you buy, make a realistic assessment of your needs.

One factor to keep an eye on is the number of externally accessible drive bays. With hard drives in the 100MB-plus range, tape drives for backup make more sense than ever, and installing one in a free, accessible drive bay makes the most sense of all (it's cheaper than an external one, and it takes up no additional desk space). The same is true of CD ROM players. The Acma, CompuAdd, CompuAdd Express, Dell, and Swan save room for externally accessible drives by using the new combo floppy drives, which put a

There's good news about service and support: Customer service is improving significantly throughout the PC industry. On a scale from 1 to 100, all but one of these systems scored over 80.

Acer AcerPower 486e DX2/50 Model 5557



VITAL STATISTICS

Processor: Intel 486DX2-50
Street price: $2243
PROS: Fast, EISA bus, local-bus video
CONS: Seven-day turnaround, case is flimsy with cover off
Contact: 800/733-2237, 408/432-6221 (fax)
Reader service no. 687

Acer's 50-MHz 486DX2 entry in our multiprocessor sweepstakes is the decisive winner here, both in its processor class and overall. This Best Buy came up with the combination of performance, price, expandability, and design it takes to deserve first place overall among 25 systems and seven processors. For starters, the Acer combines a reasonable $2243 street price with overall performance that tops that of the other DX2-50s and rivals that of some of the 66-MHz 486DX2s. Fifth fastest overall, the Model 5557 scored fifth or higher on every benchmark except the *Word for Windows* test, and even there it outpaced two 66-MHz machines. The hot PowerVision local-bus graphics accelerator—using an ATI chip set—contributed to this fast showing.

Though this is already a hot system, if you need to, you can give it an even faster future. Acer provides a variable system clock with 25-MHz, 33-MHz, and 50-MHz settings. That means you can swap in a 50-MHz 486DX or a 66-MHz OverDrive. And your upgrade possibilities don't stop there. The CPU socket is a 238-pin model designed to accept not only 486 CPUs but also the next-generation upgrade processor, which is reportedly based on Intel's new Pentium technology.

We can't fault the Acer's expandability: The unusual motherboard design combines a proprietary local-bus slot (filled by the video card), four free EISA slots, and two open 8/16-bit ISA slots. This compact desktop leaves plenty of room for drives, too—even with three of the six bays filled with two standard floppy drives and a 202MB Conner CP30204 hard disk. There are still two externally accessible bays free for adding extra storage devices, such as an internal tape drive or a CD ROM player.

In most respects, the Acer's design is excellent. The case (which can be easily converted for tower use) slips off and on with no screws required, and although it's a little inconvenient getting to the RAM under the hard disk and power supply cables, accessibility to the motherboard is good. In addition, the documentation is clear and concise, and the system has built-in security functions you can activate using the system's CMOS setup program. The only real fault we could find was the flimsiness of the internal casing, which, during our testing and evaluation of the system, made us uncomfortable with moving the PC around without its top cover in place.

The final piece of the puzzle is service and support, and here Acer has made dramatic strides. The company now provides a year of free on-site service and a toll-free technical support line with Saturday hours. We spent some time on hold during midday

5¼-inch and a 3½-inch floppy drive in a single half-height bay.

In addition to expandability, we also rate design to evaluate a system's overall value. One of our first design considerations is internal accessibility: How easy is it to get to essential items on the motherboard, such as the external RAM cache and the CPU? We also consider the documentation, the quality of the keyboard, the size of the display, and other more subjective details, such as the quality of assembly and the sturdiness of the system case.

The Best Buys

When we finally totaled up all the ratings for each system, our findings agreed with our price/performance assessments of the various CPU classes. The 50-MHz 486DX2s made the strongest showing, occupying three of the top five positions for overall value.

The best overall rating goes to Acer's AcerPower 486e DX2/50 Model 5557. The Acer took first place with a compelling combination of speed, expandability, and design. Following the Acer are two more DX2-50s, the Acma 486DX2/50 and the Tangent Model 450ix. Like the Acer, these machines are among the best in overall price/performance. Each has great service and support, and while the Acma stands out on design factors, the Tangent rates high on expandability.

Rounding out the top five are the Zeos 486DX-33 and the AST Bravo 4/66D Model 123B. The Zeos was buoyed up by its impressive overall performance (it was the fastest 33-MHz 486DX) and high marks for expandability and design. The AST had the best overall performance of any machine in the review and a lower price than any other DX2-66.

While our evaluation indicates that systems using the Intel 50-MHz 486DX2, 33-MHz 486DX, and 66-MHz DX2 represent the best overall values right now, that doesn't mean PCs with other CPUs aren't great values. Also, the fact that a 486SX-25 from vendor A didn't do well in this roundup doesn't mean another system from vendor A (particularly those using a DX2-50, DX-33, or DX2-66) wouldn't make a smart buy. The only result of this review that you can use to generalize about a given vendor is our service-and-support rating.

Things aren't standing still, either. While AMD suffered a recent setback in its quest to launch its own 486 chip (a court ruled that AMD's design hewed a little too closely to Intel's), the company still expects to deliver a 486-like CPU this year. Meanwhile, Intel will be coming out with the Pentium chip, which should knock 486 prices down a notch or two. Word has it that one or more of Intel's rivals are developing their own successors to the 486. For the time being, however, it's clear that each of these available 486 processors has its merits, and the competition between Intel, Cyrix, and IBM will only mean more and better CPUs and better prices. That said, it appears that—for now at least—Intel still rules the desktop.

Rex Farrance and Dan Miller are assistant editors for PC World. *They can be reached on PC World Online (see page 8 for more information).*

calls, and Acer has a long seven-day turnaround policy, but otherwise the company's new service-and-support package is A-OK. When we add up all the positives of this system, we can come to only one conclusion. Although we see great equipment every day, this PC is the kind of system we'd go out and purchase for ourselves—and that's why it's an easy pick as the best of this illustrious collection of systems.

Acma 486DX2/50

VITAL STATISTICS

Processor: Intel 486DX2-50
Direct price: $2071
PROS: Excellent service and support, 15-inch monitor
CONS: Seven-day turnaround policy, poor accessibility to Weitek socket
Contact: 800/786-6888
Reader service no. 688

We looked at this same basic system in our October review of 50-MHz 486DX2s, and it won a Best Buy. Well, surprise—it wins another here. That shows remarkable consistency and longevity in a volatile market. Often a product's development cycle—from initial production to replacement by a newer model—is complete in four to six months. This one still has what it takes to stand up to the competition.

The last Acma 486DX2/50 we looked at was maxed out for speed, with a full 256K RAM cache, a 4MB caching hard disk controller, and a 244MB hard disk. This model has a more economical configuration, with a 64K external memory cache (expandable to 256K) and a standard cacheless IDE interface to a 119MB Seagate ST3144A drive. The system's performance is a respectable middle-of-the-pack in its class, and its $2071 price is the lowest of any of the 486DX2-50s here.

The Acma has an adjustable clock that you can jumper all the way up to 50 MHz. Your likeliest upgrade, however, will be to make a stop at 33 MHz and install a 33/66-MHz OverDrive CPU.

Acma gives you a sturdy compact desktop case, which gives you reasonable, if not outstanding, expandability. Four 8/16-bit slots are free. Another unfilled 8-bit slot would be usable if Acma had mounted the I/O ports on the system case instead of on the 8-bit slot's cover. Accessibility to the CPU socket and the memory is good, but high-end CAD users will have difficulty installing a Weitek coprocessor, because the socket is tucked away beneath the drive cage. Fortunately, all four drive bays are externally accessible, and Acma provides a combo floppy unit that takes up just one bay, so you'll have plenty of room for more storage. The 15-inch Mag monitor is a terrific addition.

Acma's service-and-support package is a real strong point. You get a year of free on-site service and toll-free technical support—even on weekends. Although Acma's tech support department is small, every one of our calls was answered promptly with an impeccably accurate response. Wrapping up this kind of service package with a terrific price makes this 50-MHz 486DX2 a tremendous value and a Best Buy.

ALR Flyer 32 LCT

VITAL STATISTICS

Processor: Intel 486SX-25
Street price: $2009
PROS: Outstanding device capacity, CPU card upgradable to 66 MHz
CONS: Access to RAM sockets slightly impeded by drive cage
Contact: 800/444-4257
Reader service no. 689

ALR's Flyer 32 LCT is a tall, good-looking tower model with the kind of expandability we really like in a server or high-end workstation. In fact, this PC gives you a mind-boggling ten free slots and a total of 12 drive bays. Even if you manage to fill up all those bays, the 300-watt power supply should keep it from blowing a fuse.

Moreover, the Flyer is no slouch when it comes to performance. Its 25-MHz 486SX processor is only the fourth most powerful here, but it's notable that the ALR outpaced all the other 25-MHz machines in this review as well as all of the 33-MHz 486DLCs. The system comes with the external memory cache filled out to 256K and uses an integrated video accelerator featuring the WDC 90C30-ZS chip.

Our system came with a 112MB Western Digital Caviar 2120 drive complemented by two standard floppy units. Accessibility is good—our only quibble is with the memory position of the slots for the memory SIMMs, which are hard to get at under the 3½-inch drive cage. But every single slot will accept a full-length card, and the design and layout are terrific otherwise. ALR even takes care of the smaller touches: For example, the CPU card and external RAM cache are both supported at the top with a bolt fastened to the frame, making for an extra-stable installation.

You'll be able to match your horsepower to the future demands of your applications, too. As it stands, you can purchase either a 33-MHz 486DX or a 66-MHz 486DX2 processor card for the system. The most obvious upgrade is to install a 25/50-MHz OverDrive processor in your existing card. But if you like, you can go for a two-step approach, installing a 33-MHz 486DX card and then later swapping in a 33/66-MHz OverDrive.

ALR's service-and-support package is outstanding. On-site service is available for a nominal $10-a-year processing fee, there's a three-day turnaround policy on off-site repairs, and you get toll-free technical support for the life of your system. In addition, you get access to ALR's 24-hour BBS and technical fax-back lines. When we called the company's tech-support people, our questions were all answered promptly and accurately.

This is a PC with a lot going for it. The 25-MHz 486SX CPU doesn't give the kind of performance or value found in the 486DXs and 486DX2s. Still, if you need a server or workstation with big-time peripherals capacity—and you want to get an economical start with one of the fastest 486SX-25s around—this PC should solve your problem.

AST Bravo 4/66D Model 123B

VITAL STATISTICS

Processor: Intel 486DX2-66
Street price: $2413
PROS: Fastest system overall, ZIF socket
CONS: Only two externally accessible drive bays
Contact: 800/876-4278, 714/727-4141
Reader service no. 690

The hot-blooded AST Bravo 4/66D is your top choice if you want a Best Buy system that's also a top-level performer. We're not kidding about the speed, folks: With its 66-MHz 486DX2 processor, full 256K external memory cache, and integrated video accelerator, the AST came in first overall as well as on the *Freelance*, *Paradox*, and BAPCo suite of applications tests. The Bravo 4/66D also placed second and third on the *Excel* and *Word for Windows* tests, respectively. The bottom line: This is the fastest system we have ever tested.

Speed alone isn't enough, however, to earn the system its overall Best Buy recommendation. Price plays a major role in making the AST a great value. At a reasonable $2413 on the street, it beats the Hewlett-Packard Vectra 486/66N PC Model 170—the next cheapest 486DX2-66 in this review—by more than $200. It's cheaper than one of the DX2-50s and one of the DX-33s. As a result, this is the only 66-MHz 486DX2 model reviewed to make it into the top five for overall value.

The hot-blooded AST Bravo 4/66D is your top choice if you want a Best Buy system that's also a top-level performer. The bottom line: This is the fastest system we have ever tested.

Inside the AST's compact desktop case, you'll find a tiny motherboard with a zero insertion force (ZIF) socket for effortless CPU swapping. The ZIF socket is a nifty feature, but with the system already maxed out with the 66-MHz 486DX2 installed, you'll probably never have to use it. You get a respectable four free 8/16-bit expansion slots, four drive bays, and a 116MB Quantum ProDrive LPS hard disk. However, both of the externally accessible bays are taken up by the standard floppy drives, so you won't be able to add a tape or CD ROM drive to the machine—an unfortunate limitation in an otherwise beautifully designed machine.

AST's customer service-and-support package is very good. It includes a year of free on-site service, an outstanding two-day turnaround policy on factory repairs, and toll-free technical support (even on weekends). Getting through to the AST technicians proved very easy, and they answered all our questions quickly, courteously, and accurately. This kind of excellent service, reasonable price, and blazingly fast performance makes this machine easy to recommend. If you're the kind of person who *has* to have the fastest, this PC is your natural Best Buy.

ATronics Int'l ATI-486SX/25

VITAL STATISTICS

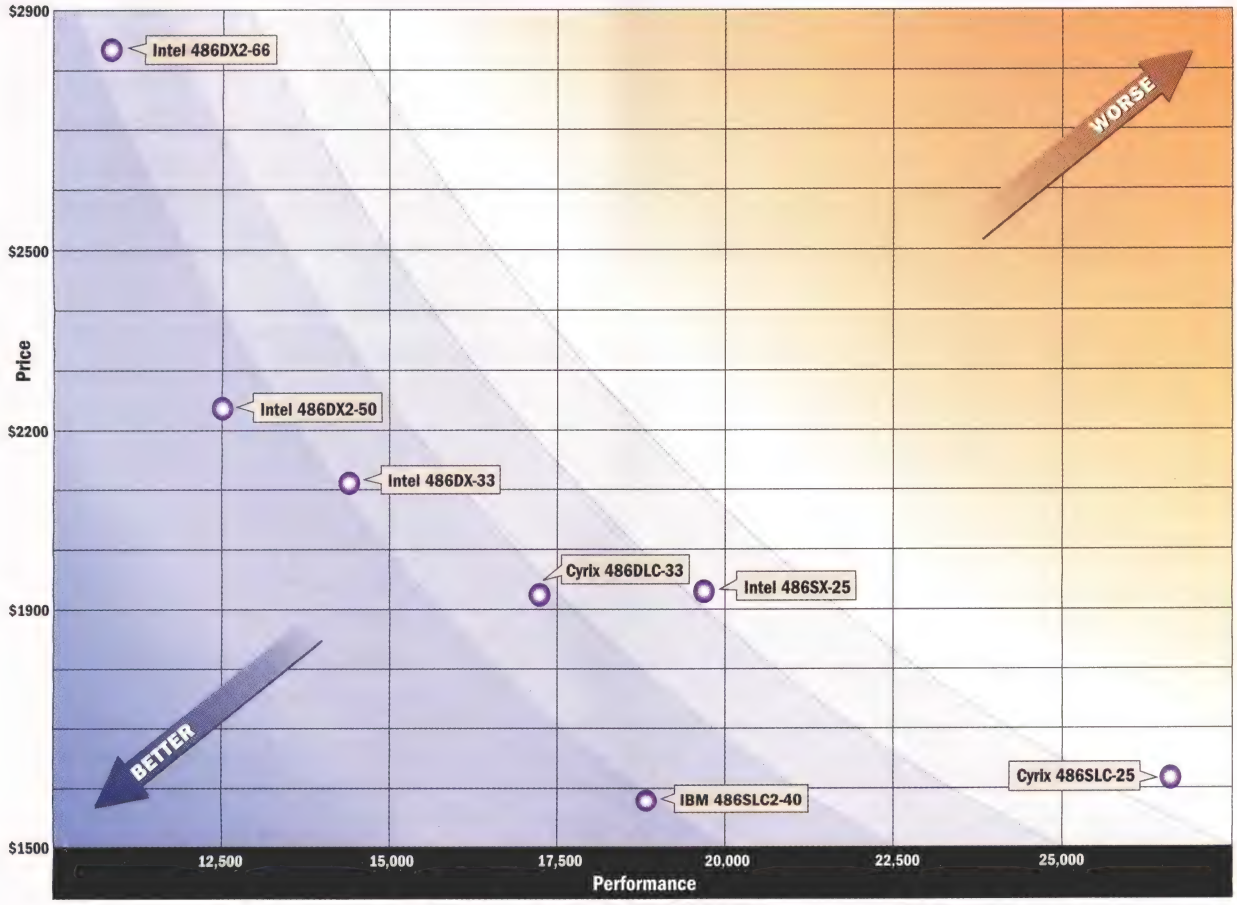
Processor: Intel 486SX-25
Direct price: $1795
PROS: Good device capacity, good price
CONS: $99 charge for on-site service
Contact: 510/656-8400, 510/656-8560 (fax)
Reader service no. 691

The ATronics Int'l ATI-486SX/25 is another tower model with lots of room for drives and other peripherals. The big, good-looking case houses a small, intelligently designed system board with eight slots (half a dozen are free). There are no obstructions in this highly accessible setup, and every slot will accept a full-length card. You get a total of nine drive bays (six are externally accessible), so you have plenty of room for additional drives.

We ordered this unit with a 25-MHz 486SX processor, which is by no means a powerhouse compared to much faster 33-MHz, 50-MHz, and 66-MHz competitors. But the ATI-486SX/25 is a respectable performer—in its class—and this machine is eminently upgradable. It will accept any of the 486 processors, including a 66-MHz 486DX2 (if you adjust the system clock to 33 MHz). Or you can run the clock at 50 MHz and install a 50-MHz 486DX. Since you already have 256K of external memory cache and a Diamond Stealth VRAM graphics accelerator installed, the cost of your upgrade will be limited to the price of a new CPU chip.

Speaking of cost, the ATronics's $1795 price is very attractive, and this system missed our top five price list by less than $100. As for customer service and support, ATronics did a superior job of responding to the questions we posed over the company's toll-free line. In addition, ATronics has a three-day turnaround policy for any

How the Chips Fell



THE BEST PRICE/PERFORMANCE VALUE is found in the Intel DX2-50–based systems, followed closely by a system using the IBM 486SLC2-40. Close behind them are PCs based on the Intel 486DX-33 and the Intel 486DX2-66. The numbers given are averages for all the systems of a given processor type in this review; they provide a general indication of the price and performance levels for systems based on that particular processor. Price/performance numbers for individual systems vary widely.

Notebooks

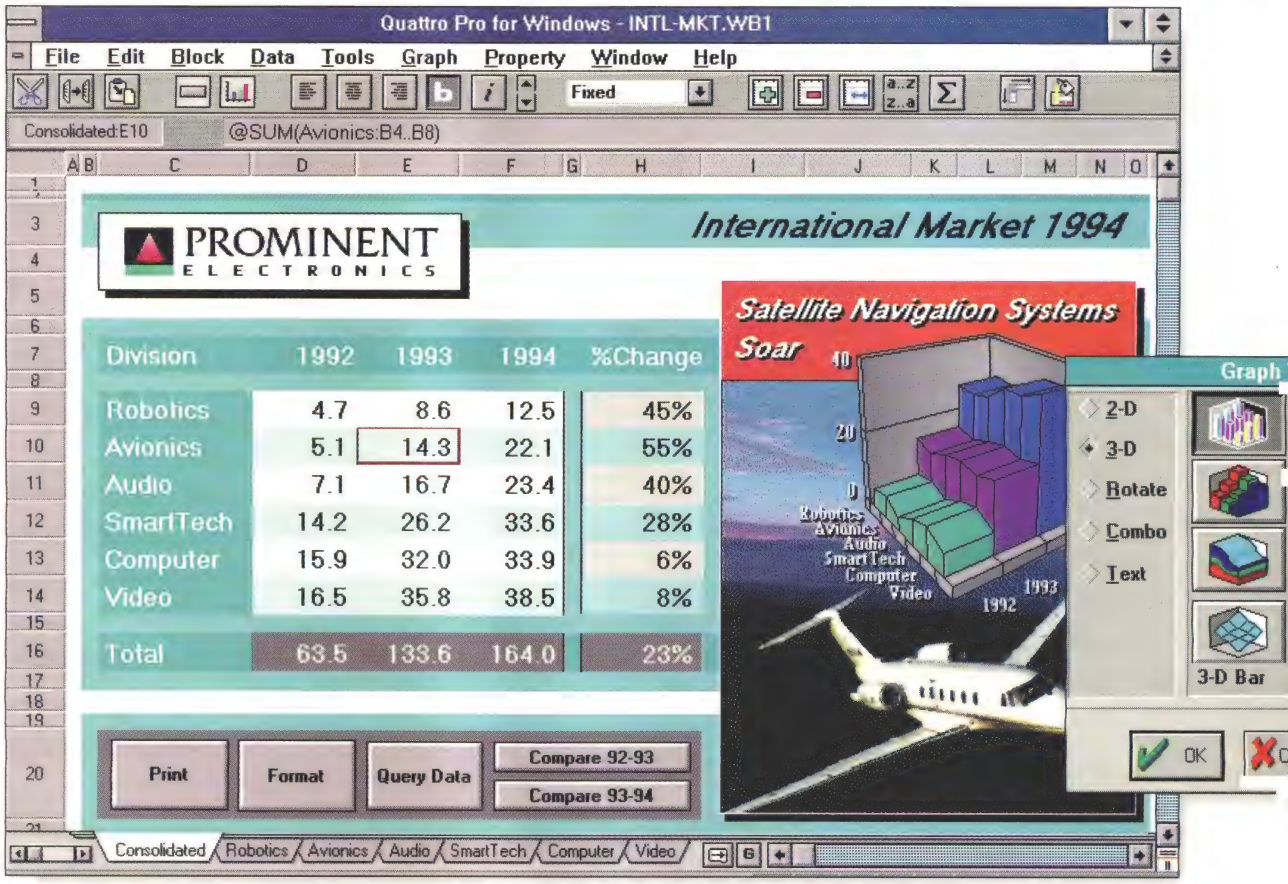
Object Inspector

Database Access

1-2-3 Compatibility

Most Usable

Excel and 1-2
Quattro Pro



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3 users prefer for Windows

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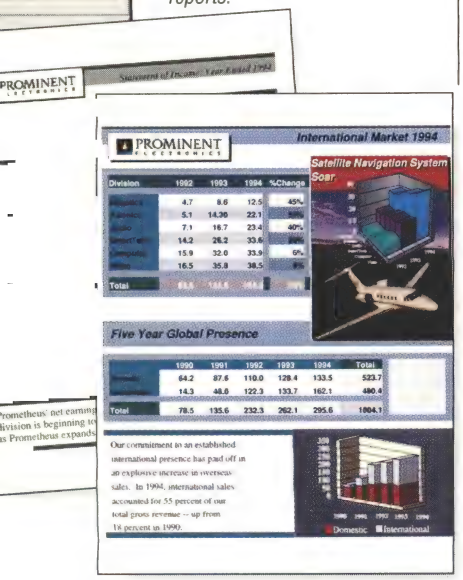
◀ *The Object Inspector makes it easy to view and select your options.*

▼ *WYSIWYG printing makes it easy to create high-impact reports.*



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PC MAGAZINE EDITORS' CHOICE

Quattro Pro for Windows
November 10, 1992

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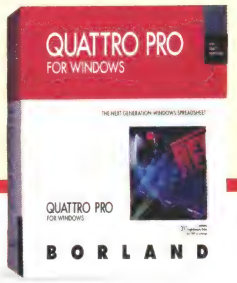

BORLAND

Software Craftsmanship

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Circle 63 on reader service card

Notebooks | Object Inspector | Database Access | 1-2-3 Compatibility | Most Usable

necessary factory repairs. The only faults we can find with the service package are that you have to pay $99 for a year of on-site service and that there's no weekend support. If you're looking for a well-designed, low-priced PC that is ready to grow with you, the ATronics is a fine value.

Austin 486/DLC-33

VITAL STATISTICS

Processor: Cyrix 486DLC-33
Direct price: $1846
PROS: Terrific support
CONS: Not user upgradable, memory cache access blocked by drive cage
Contact: 800/752-1577, 512/454-1357 (fax)
Reader service no. 692

In this crowd, it's quite an accomplishment to rate number one in service and support, but that's just what the Austin 486/DLC-33 does. Here's what you get: a year of free on-site service complemented by a two-day turnaround policy and an outstanding 24-hours-a-day, 365-days-a-year toll-free technical support connection. On top of that, in our anonymous telephone checks, Austin's technicians proved to be perfect diagnosticians.

Unfortunately, reliable technical support and generous customer service policies alone are not sufficient to merit the system a Best Buy. This PC, which offers 25-MHz 486SX–class performance, has one glaring problem: It is not user upgradable. What you see is what you get—forever. Austin tapes a seal across the 33-MHz Cyrix 486DLC processor, informing you that your warranty is void if you remove it.

Still, with the DLC-33 chip in place, this system showed respectable speed for its class, turning in a performance within 3 percent of the overall fastest of the 486DLCs and better than four of the five 486SX-25s. It did particularly well on the *Word* and *Excel* portions of our *Windows* tests.

The system comes with a speed-enhancing 128K external memory cache—but upgrading it to its 256K maximum capacity is difficult because of its position under the 3½-inch internal drive cage. Otherwise, accessibility to the baby motherboard is fine. And the $1846 price is attractive as well.

Like many of the other companies in this roundup, Austin installed its I/O ports on one of the slot covers, which puts that slot out of commission unless you feel like reinstalling the ports in the screw-equipped case cutouts. Total device expandability is quite good, however, with six free slots (if you count the obstructed one) and five total bays. Three bays accept externally accessible drives, so even with the two floppy drives installed, you wind up with one of the bays free.

The great service-and-support package and reasonable price make this system tempting for applications not requiring a top-speed system. However, the inability to upgrade the system's entry-level CPU makes it less attractive than some of the other, more upgradable low-end systems in this review.

Blackship BLK 486/33 ISA

VITAL STATISTICS

Processor: Intel 486DX-33
Direct price: $1795
PROS: Good balance of price and performance
CONS: Access to CPU blocked by drive cage
Contact: 800/531-7447, 408/432-1443 (fax)
Reader service no. 693

The Blackship BLK 486/33 ISA system is a nice-looking minitower model with a 33-MHz 486DX processor. It comes with all the basics, including a 64K external memory cache you can expand to 256K, an Orchid Fahrenheit 1280 video accelerator, and a 124MB Maxtor 7120A hard disk. This PC has good overall speed, and you can buy it for a thrift-conscious $1795. As a result, it provides a very attractive balance of price and performance. And you have plenty of growing room in its five drive bays and seven free slots. Two of the 8/16-bit slots will accept just a half card; they're obstructed by the drive cage. But with all these slots, who's counting? What's more, with the two standard floppy drives installed, you still have two free externally accessible drive positions.

Blackship uses good components, and the American Megatrends Incorporated (AMI) Super Voyager motherboard is no exception. Fortunately, the Super Voyager provides an upgrade socket, which you can use if you want to add a 33/66-MHz OverDrive processor. You'll have to totally remove the 3½-inch drive cage if you want to retrieve the 33-MHz 486DX chip, however.

Blackship's technical support is very good, providing a year of free on-site service, toll-free technical support (weekdays only), and a two-day turnaround policy. Although Blackship just missed the brass ring, this system's price/performance dividend makes it a solid investment.

Compaq Deskpro 4/66i Model 120

VITAL STATISTICS

Processor: Intel 486DX2-66
Street price: $3037
PROS: Fast, includes Business Audio, excellent documentation
CONS: Limited device capacity, no turnaround policy
Contact: 800/345-1518, 713/370-0670
Reader service no. 694

Business users all over the country rubbed their hands together in glee when Compaq announced its dramatic price cuts last summer. All of a sudden you could buy a Compaq at clone prices. The $3037 street price on the Deskpro 4/66i Model 120 is still the second steepest here—but you get a 66-MHz

486DX2 for your money. And the performance of this handsome little low-rise system is second only to that of the AST Bravo 4/66D. Even with its external memory cache maxed out at a relatively low 64K, it blew away all comers on our *Excel* test, topped the field on *Word for Windows*, virtually tied for first on *Paradox*, and scored second on *Freelance*.

With this system you also get Compaq's integrated QVision accelerator and the company's new Business Audio feature, which lets you annotate *Windows 3.1* documents with voice notes to voice-illustrate presentations and training programs, or even ask the boss—nicely—for a raise at the end of a particularly good quarterly report. Compaq complements this package with a microphone and headphones, for which there are jacks in the back of the case.

Unfortunately, that case is not easy-open—unusual for Compaq—and it doesn't give you much room to expand. You get only three free 8/16-bit ISA slots, and the drive bays are already filled with the 116MB Quantum hard drive and the two standard floppy units. Too bad Compaq didn't install one of the nifty new combo floppy drives that fit both standard floppy drives into a single bay. Clearly, this box was designed to be used as a fast LAN workstation or for an application where expandability isn't essential. Your access to the RAM is impeded by the hard drive cage, so we suggest you get all the RAM you think you might need installed by the dealer before you pick up your system.

The service package includes a year of free on-site service and toll-free technical support (available weekends). To make it less likely that you'll need to call, the documentation is a joy, right down to the motherboard layout map and switch guide pasted to the top of the floppy drive cage. Unfortunately, there's no service turnaround policy for off-site repairs. The general quality, fit, and finish of this PC is excellent, however. So if you can afford to pay the price and you don't need expandability, this PC could be a good purchase. After all, it is a Compaq.

CompuAdd 433DLC

VITAL STATISTICS

Processor: Cyrix 486DLC-33
Direct price: $2260
PROS: Multiple upgrade paths, very good documentation
CONS: Relatively pricey
Contact: 800/456-3116, 512/250-1489
Reader service no. 695

CompuAdd sells its PCs both through the mail and at its 114 retail outlets in 38 states. This unit, the 433DLC, is a low-rise 33-MHz Cyrix 486DLC system with a universal CPU socket that will also accept any Intel 486 chip, including the hot 33/66-MHz OverDrive CPU. The 433DLC performed well in its class; it was the fastest 486DLC system overall, although not quite as fast as the ALR Flyer 32 LCT 25-MHz 486SX. The performance of the 33-MHz 486DLCs seemed to max out in the same range as Intel's 25-MHz 486SX, probably because of the 486DLC's tiny cache: The SX has an 8K internal cache; the DLC's is 1K. So even though the SX runs at a lower clock speed, its performance is roughly comparable to the DLC-33's. The CompuAdd features an external memory cache filled out to 128K, an integrated Tseng ET 4000AX video accelerator, and a math coprocessor.

CompuAdd put a reasonable amount of peripherals capacity into this low-profile box, providing three 8/16-bit slots and two 8-bit slots. The two 8-bit slots can accommodate only half cards because of their proximity to the drive cage. There are only three drive bays total, but CompuAdd wisely extended capacity by including a two-in-one combo floppy drive. So even with the 119MB Seagate ST3144A hard drive installed, you still have a spot left to add a tape drive or other storage device.

The documentation is wonderful, and CompuAdd's service-and-support package is top-notch. Along with a year of free on-site service and a three-day service turnaround policy, you get 24-hours-a-day, 365-days-a-year toll-free technical support. This system's Achilles' heel is its $2260 price—pretty steep for a PC with such modest performance. The CompuAdd has quite a bit going for it, but if you're set on buying a 486DLC PC, the Micro Express system offers a better value.

CompuAdd Express 425CX

VITAL STATISTICS

Processor: Cyrix 486SLC-25
Direct price: $1618
PROS: Second lowest price
CONS: Poor price/performance, no upgrade path, no external RAM cache
Contact: 800/925-3000, 512/219-1800
Reader service no. 696

CompuAdd Express, a CompuAdd offshoot, is a separate business entity that sells solely by direct mail—with a particular focus on price-sensitive buyers. Because of the corporate ties, we weren't surprised to find strong similarities between the CE 425CX and the aforementioned CompuAdd 433DLC. The case design is identical, and you get the same five free slots, three bays, and combo floppy drive.

The 425CX uses a different motherboard from the CompuAdd 433DLC, with a postage stamp–size Cyrix 486SLC processor hard wired in—no upgrades allowed. The system won't accommodate an external RAM cache (the SLC chip has a 1K internal cache) but does provide an integrated Western Digital WD90C31 graphics accelerator and an 80387 coprocessor socket.

The 425CX really shines on price: Of the 25 machines in our roundup, this $1618 PC is the second least expensive; only the Reply Model 16 486SLC2 costs less. And the service and support also rates well, although you get 10 hours of daily support instead of CompuAdd's 24, and you can't call on weekends. Unfortunately, since the 425CX's performance is so poor, and since the system already paints you into a corner when it comes to upgradability, we can't recommend it.

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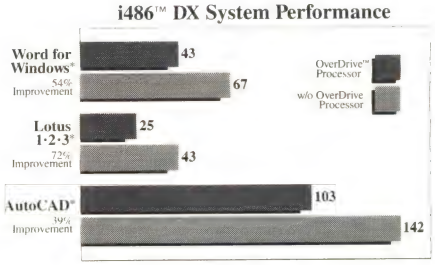

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CompuTrend Premio 486SX/25

VITAL STATISTICS

Processor: Intel 486SX-25
Street price: $1759
PROS: Good price
CONS: Poor performance, poorly installed motherboard
Contact: 800/677-6477, 818/333-5121
Reader service no. 697

The CompuTrend Premio 486SX/25 features a miserly $1759 price and a good-looking compact desktop case. But speed is another story. Although it has a 64K external memory cache (upgradable to 256K) and a Western Digital Paradise graphics accelerator card, this was by far the slowest of the five 486SX-25s we tested and the third slowest system of any kind overall in the roundup.

The Premio has five externally accessible drive bays, and the system comes with six unoccupied slots in our configuration. Unfortunately, the end of the motherboard with the CPU socket is completely unsupported; unless you're careful, you could damage the motherboard during a CPU swap.

CompuTrend's service is adequate if not outstanding. The system comes with three months of on-site service, which you can extend to one year for $75. If you're on a 486SX-25 budget, you might be lured by the Premio 486SX/25's low price. Considering its benchmark scores, however, you can get a much faster start elsewhere.

Copam 486SXB/25

VITAL STATISTICS

Processor: Intel 486SX-25
Street price: $1681
PROS: Excellent price, CPU-card upgrade to 50-MHz 486DX
CONS: Mediocre performance
Contact: 800/828-4200, 510/623-8551 (fax)
Reader service no. 698

Copam's 25-MHz 486SX packs one of the best price tags in the review. At $1681 on the street, it's priced within about $100 of the cheapest machine here. This 486SX system uses a CPU-card design, with 33-MHz and 50-MHz 486DX processor cards also available. And like any 486SX-25, the system also accepts a 25/50-MHz OverDrive CPU. Low price notwithstanding, Copam was able to supply a generous 201MB Seagate ST1239A hard disk. Also, users concerned about display emissions will find Copam's low-radiation monitor attractive.

Performance is nothing to write home about; overall the system ranked fourth from the bottom. The service-and-support package includes a three-day service turnaround policy and toll-free support (but not on weekends). On-site service for the first year costs a hefty 8 percent of the system price. Still, the fine price, good upgradability, and general quality of assembly all combine to make this system a decent value—and an even better one if you install a 25/50-MHz OverDrive upgrade to crank up performance.

DEC DECpc 466d2 LP

VITAL STATISTICS

Processor: Intel 486DX2-66
Direct price: $2969
PROS: Fast, excellent service
CONS: Pricey, only three expansion slots
Contact: 800/722-9332, 800/524-5694
Reader service no. 699

You expect 66-MHz 486DX2s to be fast, and the DECpc 466d2 LP's performance sparkles—the system placed fourth overall and finished third on the *Paradox* test and the BAPCo test suite. You get a filled-out 256K external memory cache and an integrated S3-based video accelerator.

The 466d2 LP is a good-looking little workstation, but don't expect much expandability—you get only three 8/16-bit ISA slots that hold cards horizontally. Only two of the four drive bays are externally accessible. DEC provides a 116MB DEC LR74992 hard disk with this system.

When it comes to service, DEC is among the five best vendors in our review. A two-day service turnaround policy, a year of free on-site service, and toll-free technical support are all standard. And our technical questions were answered to perfection. DEC lacks only a weekend line. So what's not to like about this system? The $2969 price, for one thing—it's the third highest here. High cost and limited expandability pulled the DECpc 466d2 LP's overall value rating into the bottom third of the review, despite the great performance and outstanding service.

Dell 486D/66

VITAL STATISTICS

Processor: Intel 486DX2-66
Direct price: $3218
PROS: Third fastest system, excellent design
CONS: Highest price in review
Contact: 800/289-3355, 800/727-8320 (fax)
Reader service no. 700

The 66-MHz 486DX2 Dell system was the third fastest machine overall in the review—despite its lack of an external memory cache. It placed second on the more DOS-intensive

BAPCo test suite (doing particularly well on the graphics segment) and fourth on our *Windows* tests overall.

The Dell also scores points for good design. Inside the easy-open case, you'll find an uncluttered, highly integrated motherboard. Each of the six 8/16-bit slots accepts a full-length card, and the cables connecting the 116MB Quantum hard drive to the rest of the system are neatly tucked away from the motherboard. The two floppy drives are incorporated into a single combo drive, which leaves the other two externally accessible 5¼-inch bays free; the 224-watt power supply ensures you'll have plenty of juice to run those extra peripherals.

Dell's service and support has traditionally been a strong selling point. And why not, with a year's free on-site service, toll-free technical support available 18 hours a day and on weekends, and an outstanding one-day service turnaround policy?

Dell has maintained a great reputation for service, design, and quality, but the company is no longer a price leader. This machine's $3218 price may not seem terribly high, considering that this is a 66-MHz 486DX2. But it's the most expensive machine in the review, and you can buy the 66-MHz AST (which was the fastest overall performer) for $800 less. That's the kind of difference that separates the Best Buys from the good ones.

IBM: The Next Generation

Once the innovator and establisher of the PC standard, IBM fell off the price/performance curve years ago. In an attempt to address its problems and reestablish its position, IBM has reorganized its personal computer division into the new IBM Personal Computer Company. However, the changes have only just begun, and IBM's offering for our latest review fell short of the mark.

The 386SLC: You're No 486

The story began with our January systems review. We invited IBM to participate and send in the best *Windows* system it had for under $2500. We eventually received an IBM PS/2 Model 56, which is based on the company's 386SLC processor (basically a 386SX clone with a 16K internal cache). It came with 4MB of RAM and an 80MB hard drive. This clearly wasn't going to match up to the other systems in the roundup, which typically included faster 486 processors, 8MB of RAM, and 200MB hard drives—all for around the same price. IBM had just announced a new clock doubler CPU, the IBM 486SLC2. IBM first sent us an upgrade board and then a full SLC2 system.

Although this SLC2 system completed our new *Windows* test suite, it performed poorly compared with the other systems, partly due to the small amount of RAM. We asked the companies involved in the review to explain why they chose the machines they sent. IBM passed this request on to its public relations firm, which actually selected the machine and sent us the explanatory letter. The public relations firm says it consulted with IBM in making this selection and explaining it.

We felt that IBM wasn't doing itself justice and at the least could have included more memory in its system, so we wrote to Robert Corrigan, president of the new IBM Personal Computing Company, to get a better explanation of the systems IBM has to offer. He too chose to pass the letter on to IBM's public relations firm. We decided to give IBM another chance, drop its system from that review, and try to look at one of its newly announced PS/2 Model 56 systems with XGA2, IBM's next generation of the XGA video standard.

Unfortunately, we encountered a different set of problems with the IBM system this time around: We were unable to get the XGA2 video to work with our *Windows* test suite because of an XGA2 incompatibility with the *Microsoft Test for Windows* application that controls the tests. We also noted incompatibilities with *Microsoft Word for Windows*. Once again, we were forced to leave IBM out of the main review, but this time we decided to talk about how IBM's systems measured up.

Unfortunately, we encountered a different set of problems with the IBM system this time around: We were unable to get the XGA2 video to work with our Windows test suite.

XGA2: Get the Bugs Out

The IBM PS/2 Model 56 486SLC2 is based on the same motherboard used in the Reply system in the main review. In fact, IBM manufactures the Reply motherboard. We believe the IBM PS/2 Model 56 would perform just like the Reply system. Once the bugs are eliminated from the XGA2 and its drivers, the IBM system might even turn in better times than the Reply because of tight video integration. As always, IBM's construction is excellent. Expandability isn't as good, but the system does include a SCSI adapter and drive, making it easy to add SCSI hard drives, CD ROM players, and scanners.

Where IBM really shines is in service and support. The company not only offers central support in addition to its legendary on-site service, the service is free for a phenomenal three years. At press time IBM announced dramatic price reductions, making this system very competitive. Our estimate is that the IBM system would have had a street price $100 more than the Reply's and would have ended up a slightly better overall value—not good enough to rate a Best Buy but certainly in the top half of the review.

It's unfortunate the system had problems passing our tests—especially since IBM once defined compatibility. We also were disturbed by the difficulty we had getting IBM to discuss which of its systems would be the most sensible to buy. These experiences can be seen as vestiges of the "old" IBM. The "new" IBM has been making changes. Its new ValuePoint lineup is very competitive on price. We will be examining it in upcoming reviews and are hopeful the next generation of IBM systems will offer better standardization and price levels without sacrificing the quality and support IBM is famous for.

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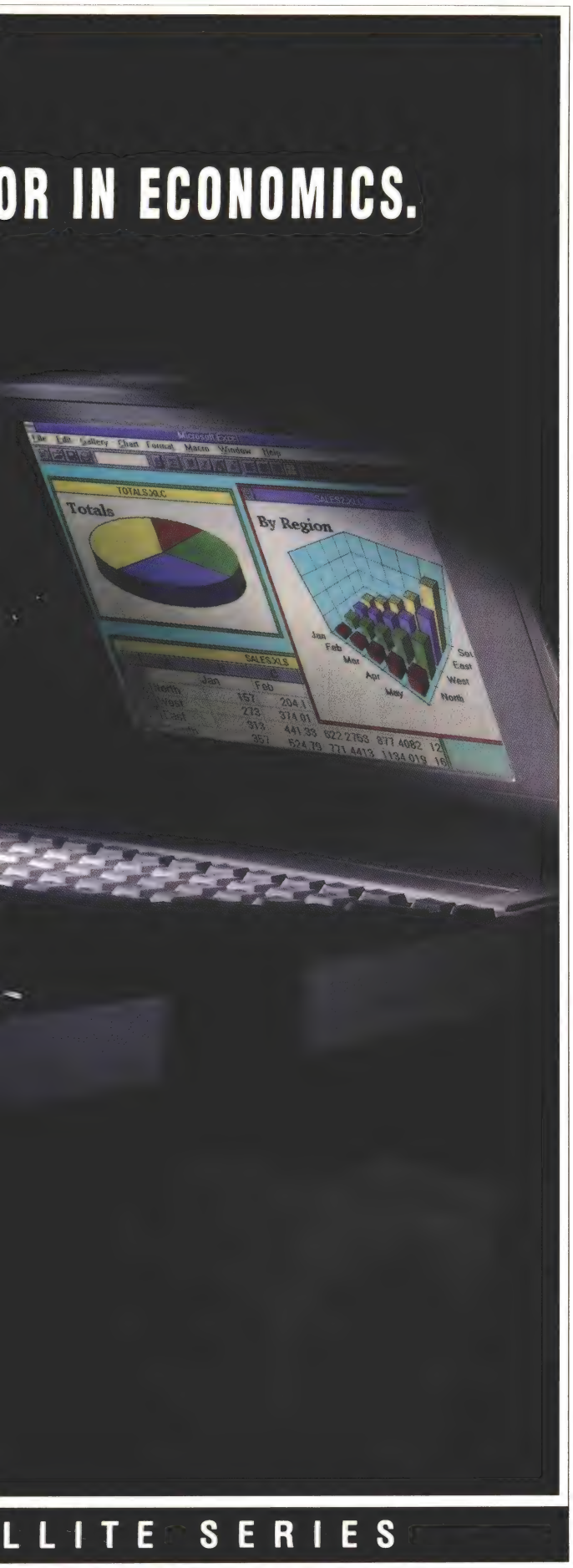

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Eltech Research Model 4330

VITAL STATISTICS

Processor: Intel 486DX-33
Direct price: $2079
PROS: Good price
CONS: Midpack performance
Contact: 800/358-8330, 510/438-0663 (fax)
Reader service no. 701

Between October 1991 and March 1992, Eltech systems won three Best Buys—an impressive record. In our June 1992 review, this Eltech DX-33 received top marks for performance and price and worthy scores for expandability and service. A Model 4330 with a somewhat different configuration just missed winning a Best Buy in last month's review of *Windows* machines. Here, in a review that examines the best systems using the plethora of processors now available, the Eltech Research Model 4330 places 9th for overall value—not bad considering that positions 6 through 11 are a virtual dead heat.

Built around the third fastest processor in the roundup, the Eltech produced middle-of-the-road speed marks, both for its 33-MHz 486DX processor class and for the review as a whole. Its overall *Windows* numbers were about 60 percent slower than the fastest system here, although it was faster than a couple of DX2-50s on the *Excel* section. It did better on our BAPCo test suite, particularly on the word processing and spreadsheet segments. The $2079 price is also about average for that class, yielding a very high price/performance rating.

In a review examining the best systems that use the plethora of processors now available, the 33-MHz 486DX Eltech Research Model 4330 places ninth for overall value.

Eltech provides 64K of external memory cache expandable to 256K, a Diamond Stealth VRAM graphics accelerator card, and a 119MB Seagate ST3144A hard drive. What's more, the company throws in a free copy of *Microsoft Word for Windows*. Expandability is more than adequate: You get six free expansion slots and five total drive bays, all of which can accommodate removable-media drives. If you need to kick up performance in the future, you'll be able to swap in a 33/66-MHz OverDrive processor.

Eltech's service and support leaves little to be desired. A year of on-site service costs a reasonable $69, the off-site service policy calls for a two-day turnaround, and the toll-free technical support is available during normal business hours and on weekends.

Extras like these have helped Eltech make a strong showing in the past. Even among machines sporting faster performance and rock-bottom prices, the Eltech remains a very respectable value—but unfortunately, not respectable enough to make it a Best Buy this time around.

Hewlett-Packard Vectra 486/66N PC Model 170

VITAL STATISTICS

Processor: Intel 486DX2-66
Street price: $2624
PROS: Compact case, integrated local-bus video, fine design
CONS: Limited expandability
Contact: 800/752-0900
Reader service no. 702

Systems in Hewlett-Packard's N series are sleek, low-profile compacts designed for use as network nodes. If you can get by with fewer peripherals, the Vectra 486/66N PC Model 170's three free 8/16-bit slots should be adequate. But two 3½-inch drive bays are too few—even with a big hard disk in the server down the hall, you're limited to a local hard disk and one 1.44MB floppy drive. If you want more room for peripherals and performance extras like an external RAM cache, you'll want to take a look at HP's U series version of this system instead.

While this 66-MHz 486DX2 computer is fast, it was the slowest by far of the 66s, and even two 50-MHz 486DX2s cranked out better overall test scores. Its best performance came on the *Word for Windows* section of our *Windows* suite. The PC World Test Center's control technicians suggested that if this system had an external RAM cache (typical on most 486s), it would have performed much better, especially considering HP's integrated S3-based local-bus video setup, which should be plenty speedy, especially for *Windows*.

We've come to expect something extra from the design of Hewlett-Packard systems, and this one doesn't disappoint us: It has an easy-open case and a motherboard that's accessible and beautifully laid out. All the ports are labeled on the back, and the documentation is top-notch. Hewlett-Packard also provides an excellent low-radiation monitor, a generous 163MB Quantum hard drive, and a cooling fan that directs a steady stream of air over the DX2 CPU, making a heat sink unnecessary.

When it comes to service and support, Hewlett-Packard ranks very high, providing a free year of its own highly regarded on-site service (most companies contract with third-party providers). In addition, HP provides a toll-free line (weekdays only) staffed by technicians who, in our experience, even make follow-up calls to ensure that their advice worked.

At $2624, the HP's price is very reasonable for a 66-MHz machine, although the Best Buy AST beats it by about $200. If you don't need capacity for more than two externally accessible drives and you want a small, relatively fast workstation, HP's fine design and customer service make the N appealing. For most buyers, however, Best Buy values like the 66-MHz AST and the 50-MHz Acer are better choices.

Insight 486-33 ISA Cache

VITAL STATISTICS

Processor: Intel 486DX-33
Direct price: $1999
PROS: Good expandability, software bundle, excellent price/performance
CONS: No on-site service
Contact: 800/755-9628, 602/350-1182 (fax)
Reader service no. 703

At $1999, the 486-33 ISA Cache is the second least expensive DX-33 here. Although Blackship's DX-33 is $200 cheaper, Insight provides a big 203MB Western Digital Caviar 2200 hard disk and adds free copies of *Stacker* compression software and *Dr. Solomon's Anti-Virus Tool Kit*. As for speed, the Insight ranked at the bottom of the DX-33s in this review, but its performance is still very respectable. Like most standard tower models, the Insight offers good expandability. The half-size motherboard has six free slots.

The main problem we had with Insight is its lack of on-site service. Insight is the only company in this review that doesn't provide at least an on-site service *option*. Insight says that it once offered on-site service, but its third-party service providers didn't do an adequate job. Insight says it now spends the money improving the quality and hours of its tech support operation. You can call the toll-free support line, and a technician will walk you through most simple repair jobs over the phone. If that doesn't work, you'll have to send the malfunctioning machine back to Insight, and the company will send you a permanent replacement in exchange. In our experience, Insight technicians provided excellent help.

If you already have an in-house support staff or you're comfortable handling your own repairs, the lack of on-site service may not concern you. The system does have a good balance of price, performance, and expandability—and it ranks in the top third of the overall values here.

Micro Express ME 486DLC

VITAL STATISTICS

Processor: Cyrix 486DLC-33
Street price: $1699
PROS: Low price, fast for a DLC, excellent customer support
CONS: None
Contact: 800/989-9900, 714/852-1400
Reader service no. 704

This unassuming DLC-based system may not look like much at first, but it manages to pack enough value into its compact case to place it just one rung below the five Best Buys. At $1699, it's the fifth least expensive system here—only about $100 more than the bargain-priced Reply Model 16 486-SLC2. Thanks in part to its big 256K external memory cache, the ME 486DLC is one of the fastest DLC-based systems overall (virtually tying the CompuAdd for first), with especially good times on the *Excel* and *Paradox* tests. The Micro Express nosed out four of the 25-MHz Intel 486SXs overall, although generally the speeds of these two processor classes seem quite comparable.

Micro Express wisely doesn't limit your upgrade options: If you want more speed, the system has a socket for the Intel OverDrive chip, so you can upgrade it to 66 MHz. There's also an 80387 socket. The ME 486DLC provides six free slots and five drive bays, with one internal and two externally accessible bays free.

Micro Express hits the top five for service and support, with a year of on-site service for $50, an outstanding two-year warranty, and a two-day turnaround policy. Cap this off with toll-free, round-the-clock, 365-days-a-year technical support, and you have a super service package. Excellent service plus great price and upgradability make this system the only DLC to place in the top ten for overall value. If you have about $1700 to spend on a respectable performer that's also an upgradable business machine, you may have just found your PC.

NEC PowerMate 486/50i-DX2

VITAL STATISTICS

Processor: Intel 486DX2-50
Street price: $2533
PROS: Local-bus video, compact case, 15-inch monitor
CONS: Expensive, unremarkable performance
Contact: 800/388-8888, 508/264-8000
Reader service no. 705

When we reviewed this basic system in our October roundup of 50-MHz 486DX2s, we praised it for its top-notch design, and we're still impressed with the way it's put together. NEC has integrated its fast Image Video local-bus graphics controller on the motherboard, and the 64K external memory cache (upgradable to 128K) is installed in an upside-down module that sits on the motherboard like a miniaturized card table. These tricks, along with some others, enabled NEC to wrap this system up in an ingeniously compact package. And you can find out plenty about the system by paging through NEC's clear, easy-to-read documentation. What's more, NEC also provides a wonderful 15-inch NEC MultiSync 3FGx monitor.

In October we deducted points for the PowerMate's so-so performance and price. The same problems persist: The NEC's $2533 price is the highest in its processor class, and while the system's performance is decent, it strays near the bottom of its processor class. NEC's service-and-support package is highly competitive. You get a year of free on-site service, a two-day turnaround policy, and toll-free technical support (weekdays only).

It's interesting to note that the 50-MHz 486DX2 processor class proved to be one of the overall best buys of the seven processor

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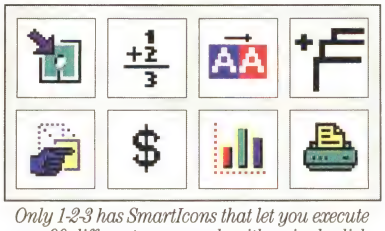

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*NSTL standards used in tests performed at Lotus on a Compaq 386/16-4 megabyte

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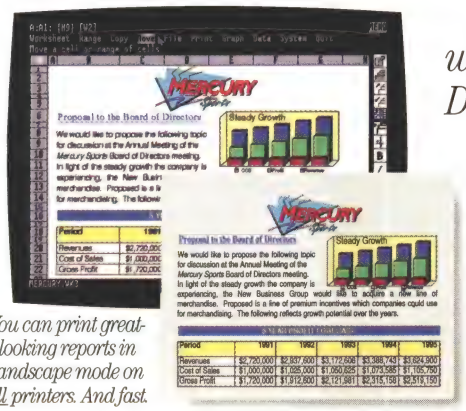

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types covered in this review. While the NEC machine was the least attractive value of the 486DX2-50s, it still rated in the middle of the pack for value. And in addition to its fine design and quality, if you treasure its 3FGx monitor, its value climbs up among the best.

PC Brand Leader 486/DLC

VITAL STATISTICS

Processor: Intel 486DLC-33
Direct price: $1695
PROS: Low price, ZIF socket for any 486 CPU
CONS: Slowest in roundup
Contact: 800/722-7263, 805/378-7801 (fax)
Reader service no. 706

At $1695, the PC Brand Leader 486/DLC is within about $100 of being the cheapest PC in the roundup. Despite being economical, however, it has the second worst overall value of any system reviewed. Why the dismal rating? Because this machine was the slowest system here by a considerable margin and 70 percent slower than the next slowest DLC. The main reason: Incompatibilities between this system and the BAPCo test suite. On the bright side, the system's performance on *Word for Windows* and *Paradox* approached the best of the DLCs, which indicates that once PC Brand irons out the wrinkles, this could be a very good system. To the company's credit, they worked with us for long hours trying to correct the problems.

The system has terrific features packed under its low-rise hood. It uses a universal ZIF socket that accepts any Intel 486 CPU. Finally, you get five free slots and a total of four externally accessible drive bays, although on our unit three of the bays were filled.

Despite this system's low price, decent design, and performance potential, we can't recommend it until PC Brand can correct its compatibility problems.

Reply Model 16 486SLC2

VITAL STATISTICS

Processor: IBM 486SLC2-40
Street price: $1578
PROS: Lowest price in roundup, CPU-card upgrades to 50-MHz 486DX2
CONS: No chip-level upgrade, no external RAM cache
Contact: 800/955-5295
Reader service no. 707

There was a time when *inexpensive* and *Micro Channel* were mutually exclusive terms. But times are a-changin', and Reply now sells Micro Channel (MCA) PCs with impressively low prices. The company's Model 16 comes with an IBM 486SLC2 processor installed in an IBM motherboard, and it sports the best price in our roundup: a mere $1578.

Not only is this system cheap, but contrary to what you might expect, its low price doesn't mean bottom-of-the-barrel performance. Sure, this processor doesn't compare to Intel's top performers, but it's faster overall than three of the 25-MHz 486SXs and one of the 33-MHz 486s. It did poorly on our *Windows* tests, hitting a consistent 22nd on every section—about 30 percent behind the fastest systems. On the DOS-heavy BAPCo test, the Reply did better, with an especially impressive showing on the software development section of the suite. For this kind of money, that's a fine showing.

Reply systems have a reputation for being very well designed and constructed, and this PC is no exception. It includes an IBM-grade Lexmark keyboard and an easy-open case. While you can't swap out the processor on the CPU card, you can choose from 33-MHz 486DX, 50-MHz 486DX, or 50-MHz 486DX2 upgrade cards. For a compact box, the five free Micro Channel slots are a generous complement, as are four total drive bays with one externally accessible bay still free.

Service and support is solid, with a year's on-site service costing $75. Repairs requiring factory service are supposed to be turned around in two days, and toll-free support lines are available weekdays. Another point in Reply's favor: It's one of the few dealer-channel vendors in the roundup that requires dealers to have a dedicated support staff trained by the vendor.

Although its processor is not one of the faster CPUs here, the fantastic price, fine design and construction, and solid service speak well for this system. If you're looking for an economical Micro Channel solution and don't need maximum power, the Reply Model 16 486SLC2 makes a great buy.

Swan 486SX/25DB

VITAL STATISTICS

Processor: Intel 486SX-25
Direct price: $2405
PROS: Two-years free on-site service, CPU-card or OverDrive upgrades
CONS: Poor price/performance
Contact: 800/468-9044, 814/237-4450 (fax)
Reader service no. 708

It's usually hard to find negatives in the Swan picture. For one thing, this company offers one of the best service-and-support packages around, with an outstanding two years of free on-site service to back up its two-year warranty. In addition, Swan provides toll-free technical support and works on Saturdays.

However, this Swan model's price is high, considering its comparatively slow 25-MHz 486SX CPU. At $2405, this PC costs more than all but one of the DX2-50s and all but one of the DX-33s. Though it ran in the middle of the SX-25 pack on our benchmarks, it finished toward the bottom of the rankings overall. It was about half as fast as the speediest DX2-66 on virtually all our benchmarks.

Swan provides a variety of ways to upgrade. The most economical would be to swap in a new 25/50-MHz OverDrive CPU on the existing processor card. But you can also buy upgrade cards that are capable of handling 33-MHz or 50-MHz 486DXs. Since the CPU board contains the processor, RAM, and BIOS, you know that these upgrades (and any future processor offerings) will have components that match perfectly.

Furthermore, the CPU module also holds an S3 video controller chip that's connected directly to the CPU using Swan's proprietary Direct Bus video architecture. Because the video subsystem is incorporated into the CPU board, you should be able to improve your video whenever you upgrade the CPU (assuming Swan incorporates future improvements in video technology into future processor boards).

In addition to the CPU and video upgradability, the Swan 486-SX/25DB gives you five expansion slots as well as four drive bays inside its full-size desktop case. The hard disk is a 124MB Maxtor 7120AT.

We would like to like this system more than we do. It may just be that we happened to catch Swan between periodic price changes. Or it may just be the company's bad luck that we asked for a model with a processor that wound up ranking as one of the lowest overall values in our roundup. This basic system is essentially a good one; we just wouldn't suggest that you buy it with a 25-MHz 486SX installed.

Tangent Model 450ix

VITAL STATISTICS

Processor: Intel 486DX2-50
Direct price: $2150
PROS: Low price, fast on Windows tests, eight free slots
CONS: Obstructed CPU socket
Contact: 800/466-3300, 415/342-9380 (fax)
Reader service no. 709

In our October review of DX2-50s, the Tangent Model 450ex, loaded with a 256K external RAM cache, a 208MB SCSI hard disk, and a 4MB caching disk controller, missed being a Best Buy by the slimmest of margins, mainly because of its high $4585 price.

The ISA-bus Model 450ix in this review is a different story: At $2150, it has the second best price in its processor class and is cheaper than several less powerful machines. Combine this affordability with good performance, expandability, and service, and you see why this time Tangent rates a solid Best Buy.

As in October, the Tangent impressed us with its speed. The 450ix is the 2nd fastest DX2-50 here and the 6th fastest system overall—but trust us, you wouldn't be able to perceive the difference between its speed and the 5th-ranked Acer's. It was the 3rd fastest system in our *Windows* test suite, with especially good times in the *Excel* and *Word* sections. It also did well on the database and graphics BAPCo benchmarks but came in a disappointing 18th in the software development test. If we isolate just price and performance, this system winds up ranking 2nd overall in the review and best in the DX2-50 class.

The Tangent Model 450ix gets high points for expandability too, with an outstanding eight slots free. You get five drive bays—two of which are filled with the standard floppy drives, one occupied by a 119MB Maxtor 7120AT hard drive, and two externally accessible

Late List Prices

Every PC review we've run in the last seven months has reported late price reductions, with the most dramatic plunges coming in summer and early fall. The drops became so steep that we wondered when they would bottom out. Over the last few months, the slope has leveled, and it now appears that prices are descending more gradually. The exceptions are the lower-priced systems: The biggest proportional cuts are on entry-level 486SX-25 and 486DLC-33 PCs. This trend bears watching; as their prices drop, these low-cost systems become more attractive values. So if you're a bargain hunter, it's worth making calls to vendors asking about the prices on their economy models.

Price Cuts Deepest on the Low End

	List price as of December 1992	Price drop from October 1992
Acer AcerPower 486e DX2/50 Model 5557	$3299	none
Acma 486DX2/50	$2395	$100
ALR Flyer 32 LCT	$3464	none
AST Bravo 4/66D Model 123B	$3205	$100
ATronics Int'l ATI-486SX/25	$1695	$100
Austin 486/DLC-33	$1690	none
Blackship BLK 486/33 ISA	$1695	$100
Compaq Deskpro 4/66i Model 120	$3590	$354
CompuAdd 433DLC	$1944	$316
CompuAdd Express 425CX	$1618	none
CompuTrend Premio 486SX/25	$1349	$410
Copam 486SXB/25	$1687	$442
DEC DECpc 466d2 LP	$2969	none
Dell 486D/66	$3218	none
Eltech Research Model 4330	$2079	none
Hewlett-Packard Vectra 486/66N PC Model 170	$3197	$301
Insight 486-33 ISA Cache	$1999	none
Micro Express ME 486DLC	$1699	none
NEC PowerMate 486/50i-DX2	$3200	$133
PC Brand Leader 486/DLC	$1395	none
Reply Model 16 486SLC2	$2019	$446
Swan 486SX/25DB	$2099	$306
Tangent Model 450ix	$2150	none
USA Flex 486/33 Cache	$2199	$116
Zeos 486DX-33	$2694	$150

bays left free. The system's graphics chores are handled capably by a Diamond Speedstar 24X accelerator. The only quibble that we have with this system is that the CPU and Weitek sockets' position under the drive cage impairs their accessibility. That restriction could make the job a little more difficult if you decided to swap the replaceable 25-MHz clock for a 33-MHz unit and swap in a 33/66-MHz OverDrive.

Service is also good: You get one full year of free on-site service, a three-day turnaround policy, and toll-free technical support on weekdays. The Tangent technicians did their usual good job at fielding our queries.

Adding up the results, the Tangent Model 450ix is faster than most systems in its processor class and less expensive than they are, too. The unit also offers top-notch service, and it gives you plenty of room to grow. Any way you figure it, this Best Buy is a solid choice for anyone looking for a speedy, reliable system.

USA Flex 486/33 Cache

VITAL STATISTICS

Processor: Intel 486DX-33
Direct price: $2315
PROS: Great service and support, fast in its class
CONS: High price
Contact: 800/769-3539, 708/351-7204 (fax)
Reader service no. 710

This system won a Best Buy in our June review of 33-MHz 486DXs thanks to excellent performance, a low price, friendly service, and good expandability.

This time around, although it's still a top ten value, it didn't quite make it into the top five, mainly because of a relatively stiff $2315 price. Only the Zeos 486DX-33 costs more in the 33-MHz 486DX class, and as you'll see, Zeos throws in some enhancements and freebies that mitigate the extra expense.

On the upside, USA Flex backs up this system so well that it places in the top five for customer service and support. The company's tech support lines are open around the clock, 365 days a year; you get a year of free on-site service; and off-site repairs are supposed to be turned around in two days. Also, the system's performance is quite good: It's the second fastest DX-33 overall, with particularly good times on the *Freelance* and *Excel* portions of our *Windows* tests, in which it was the seventh fastest system overall.

This compact desktop unit offers a respectable six free slots and an impressive seven total drive bays, and one internal and three externally accessible bays are free. In addition, USA Flex installed both standard floppy drives and a big 203MB Western Digital Caviar 2200 hard disk. While we can't renew the USA Flex 486/33 Cache's Best Buy honors this time around, we can still recommend the system, without hesitation, as a very fine value.

Zeos 486DX-33

VITAL STATISTICS

Processor: Intel 486DX-33
Direct price: $2844
PROS: Fastest 33-MHz 486DX, excellent design, Lotus software bundle
CONS: Relatively pricey
Contact: 800/423-5891, 612/633-1325 (fax)
Reader service no. 711

How does a system become a Best Buy? Speed is a crucial factor. The Zeos 486DX-33 is the fastest 33-MHz 486DX system we tested, and its performance even topped that of two 50-MHz 486DX2s. The Zeos posted especially good times on the graphics and software development sections of the BAPCo test suite and on the *Paradox* test.

Intelligent design is another piece of the Best Buy puzzle. Inside the full-size desktop case, you'll find *two* fans, one for the power supply and the other strategically aimed to cool the expansion cards. Two of the slots are VESA local-bus slots, one of which holds a Weitek Power 9000–based video accelerator card and one of which is free, along with five 8/16-bit slots and an 8-bit slot. With seven drive bays, you'll never be hurting for a place to install a drive.

Zeos provides a 25/33/50-MHz switchable clock and a 238-pin ZIF CPU socket, which means you can upgrade to any Intel 486 CPU (including the 66-MHz 486DX2) *or* plug in the next-generation, Intel Pentium–based OverDrive when it's available. In addition, Zeos gives you a SCSI connector on the motherboard, and for a few bucks more you can get an optional extension to provide an external SCSI port. It's hard to imagine a brighter upgrade picture.

At first glance you may be taken aback by the $2844 price. After all, this *is* the most expensive DX-33 in the roundup, costing more than any of the DX2-50s and two of the DX2-66s. But the price includes a capacious 234MB Seagate ST3283A hard disk and your choice of two of these three Lotus software packages: *1-2-3 for Windows*, *Ami Pro*, and *Freelance Graphics*. If you can use the software and factor in its value, that price starts to look pretty good. You also get a connection to Zeos's seven-days-a-week, 24-hours-a-day toll-free technical support, and a year of on-site service costs a reasonable $49 (second and third years cost just $99 each). When we called tech support, they answered the phone promptly and responded accurately. This is a fast, beautifully designed PC with an upgrade path that just won't quit. That spells Best Buy to us.

How does a system become a Best Buy? Speed is a crucial factor. The Zeos 486DX-33 is the fastest 33-MHz 486DX system we tested, and its performance even topped that of two 50-MHz 486DX2s.

For more information about all products in this article, circle reader service no. 902.

66-MHz 486DX2s Are Noticeably Faster Than the Competition

	Freelance for Windows 1.0	Excel 4.0	Word for Windows 2.0	Paradox 3.5 in DOS window	BAPCo SYSmark92**
AST Bravo 4/66D Model 123B* (Intel 486DX2-66)	133	103	138	125	149
Compaq Deskpro 4/66i Model 120 (Intel 486DX2-66)	141	88	110	128	126
Dell 486D/66 (Intel 486DX2-66)	143	113	152	154	135
DEC DECpc 466d2 LP (Intel 486DX2-66)	157	126	166	137	131
AcerPower 486e DX2/50 Model 5557* (Intel 486DX2-50)	170	112	152	158	121
Tangent Model 450ix* (Intel 486DX2-50)	179	104	124	167	113
HP Vectra 486/66N PC Model 170 (Intel 486DX2-66)	191	142	150	214	107
Zeos 486DX-33* (Intel 486DX-33)	192	147	181	196	108
NEC PowerMate 486/50i-DX2 (Intel 486DX2-50)	189	144	174	204	103
USA Flex 486/33 Cache (Intel 486DX-33)	190	128	166	208	97
Acma 486DX2/50* (Intel 486DX2-50)	191	148	199	180	104
Blackship BLK 486/33 ISA (Intel 486DX-33)	251	129	147	204	88
Eltech Research Model 4330 (Intel 486DX-33)	196	144	175	217	88
Insight 486-33 ISA Cache (Intel 486DX-33)	227	172	198	228	93
ALR Flyer 32 LCT (Intel 486SX-25)	267	184	211	244	86
CompuAdd 433DLC (Cyrix 486DLC-33)	247	181	218	245	83
Micro Express ME 486DLC (Cyrix 486DLC-33)	259	172	225	226	80
Austin 486/DLC-33 (Cyrix 486DLC-33)	262	178	213	255	78
ATronics Int'l ATI-486SX/25 (Intel 486SX-25)	247	172	212	287	76
Reply Model 16 486SLC2 (IBM 486SLC2-40)	272	216	261	293	80
Swan 486SX/25DB (Intel 486SX-25)	268	212	257	284	75
Copam 486SXB/25 (Intel 486SX-25)	302	227	273	305	73
CompuTrend Premio 486SX/25 (Intel 486SX-25)	374	255	275	399	59
CompuAdd Express 425CX (Cyrix 486SLC-25)	380	289	320	396	53
PC Brand Leader 486/DLC (Cyrix 486DLC-33)	232	185	216	240	31

*Best Buy

Systems are arranged in order of overall speed, from fastest at top to slowest at bottom.

****All test results in seconds except for the BAPCo test, which measures scripts per hour.**

Methodology All tests were run using systems configured as standard. If we had to install *Windows*, we performed the default installation. We configured *Windows* with a Hewlett-Packard LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. Using vendor-supplied video drivers when possible, we set the resolution to 800 by 600 pixels. On systems unable to support 16 colors at that resolution, we used 256.

Freelance for Windows 1.0 We load a single-page starter file containing a United States map with each state a separate object. Then we build a six-page presentation using charts and preview it five times with different effects. Finally, we save the presentation to disk.

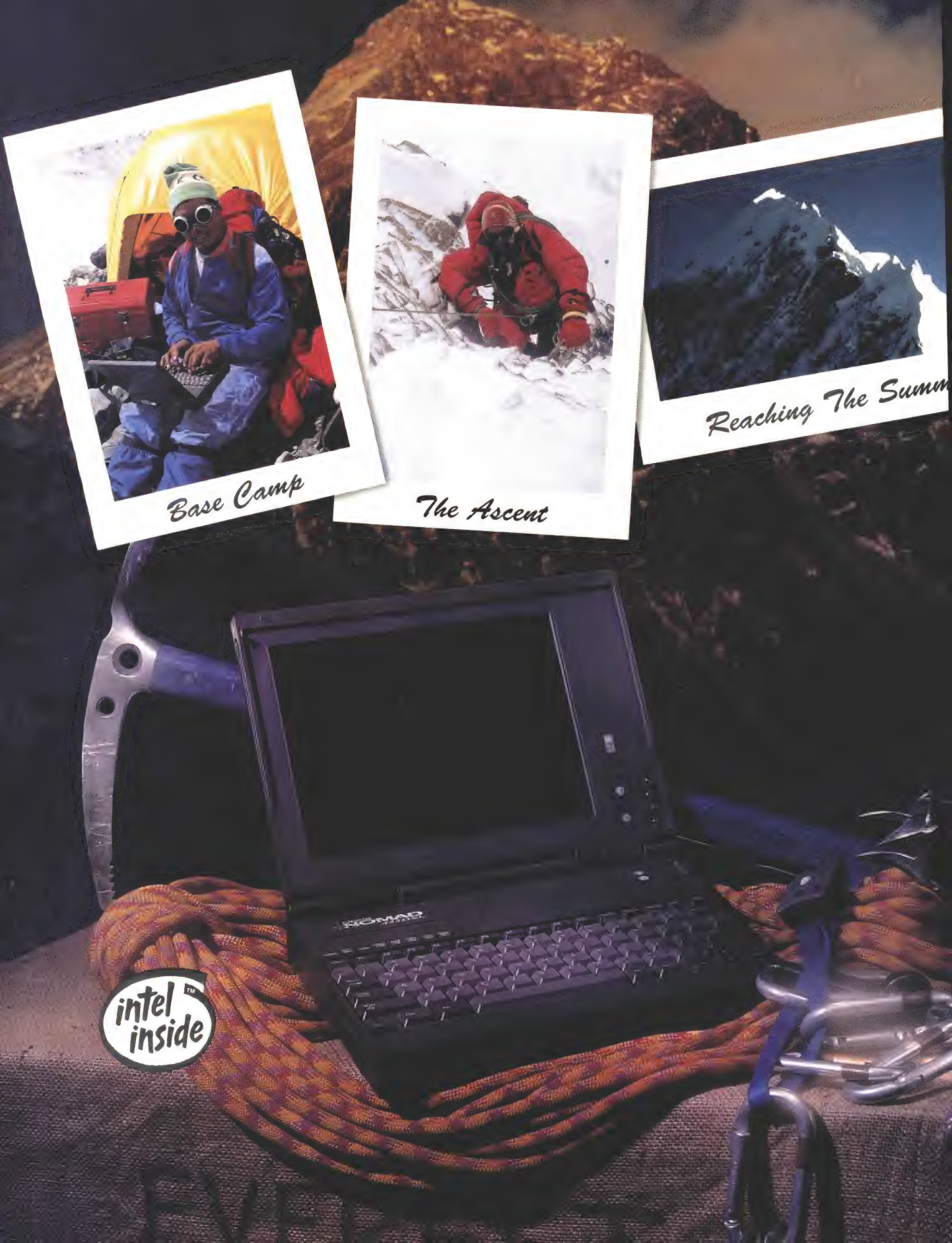
Excel 4.0 We perform several data extracts; build and format a financial statement and print it; and open a mortgage analysis, scroll, move blocks, change the interest rate, print preview the statement, and save it.

Word for Windows 2.0 We use the spelling checker and scroll through a 27-page document; create, format, print, and save a single-page business letter; and open a business proposal, add a paragraph, preview, and print it.

Paradox 3.5 in DOS window Running the program in a DOS window, we perform a variety of data entry, record searching, and updating tasks. Then we generate reports using a simple customer list.

BAPCo SYSmark92 We run a scripting program that loads common database, desktop publishing, presentation graphics, software development, spreadsheet, and word processing applications and executes a variety of typical tasks with each. The following software packages are all used in this test: *Aldus PageMaker 4.0, dBASE IV 1.1, Harvard Graphics 3.0, 1-2-3 3.1, Microsoft C 6.0, Microsoft Excel 3.0, Microsoft Word for Windows 2.0, Paradox 3.5, Quattro Pro 3.0,* and *WordPerfect 5.1.*

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.


Base Camp
The Ascent
Reaching The Summ
NOMAD
intel inside

Going to Extremes

If you want to know what the Gateway 2000 Nomad notebook PC c- endure, just ask mountaineer Wally Berg. He took the Nomad 425DXL wi him last fall on an expedition to the highest point on earth — the majestic, 29,128-foot Mount Everest in the Himalayan Mountains of Nepal.

Wally used the Nomad daily to track supplies, budget, and events of the climb. "Despite being transported over rugged terrain by yak, and operating an unheated tent with temperatures outside of 20 to 30 degrees below zero, t Nomad performed flawlessly," said Wally. "The size was perfect, too. We had so many supplies to carry that size and weight were a big consideration."

Wally powered the Nomad with three sets of NiCad batteries which he recharged with a solar panel. Wally said the batteries weren't affected by th frigid temperatures. Each battery always lasted up to six hours.

The expedition left for its final climb to the Everest summit shortly after midnight on October 9. They ascended toward the peak by moonlight, reaching the top at 8 a.m. "It was a feeling of total exhilaration to finally rea the highest point in the world," said Wally.

Even if you don't plan to take your Nomad to Mount Everest, it makes th perfect traveling companion wherever you journey. The Nomad weighs jus 5.6 pounds and measures 8.5 x 11 x 1.8 inches. Standard features include: a 25MHz Intel® 486SX or 486DX processor; 4MB RAM; an 80MB hard drive (425SXL model) or a 120MB hard drive (425DXL model); a 3.5-inch diske drive; a 10-inch backlit VGA screen; a comfortable 79-key keyboard and FieldMouse™ portable pointing device; MS-DOS,® Windows™ and Works fo Windows.™ Perhaps the most attractive feature is the price:

Nomad 425SXL ■ $1995 **Nomad 425DXL ■ $2695**

A Nomad gives you portability, 486 desktop performance, a great screen and keyboard, outstanding battery life — plus incredible durability. So take from Wally Berg. If the Gateway Nomad can endure an Everest expedition, can take almost anything!

GATEWAY2000

800-523-2000

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605-232-2000 • Fax 605-232-2023

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FEATURES COMPARISON

50-MHz DX2s Top the Best Buy List

● Yes
○ No
n/a = not applicable

	BEST BUY Acer AcerPower 486e DX2/50 Model 5557	BEST BUY Acma 486DX2/50	ALR Flyer 32 LCT	BEST BUY AST Bravo 4/66D Model 123B	ATronics Int'l ATI-486SX/25	Austin 486/DLC-33	Blackship BLK 486/33 ISA	Compaq Deskpro 4/66i Model 120	CompuAdd 433DLC	CompuAdd 425CX	CompuAdd Express
Standard features											
Direct/street price 10/15/92[1]	$2243	$2071	$2009	$2413	$1795	$1846	$1795	$3037	$2260	$1618	
CPU	Intel 486DX2-50	Intel 486DX2-50	Intel 486SX-25	Intel 486DX2-66	Intel 486SX-25	Cyrix 486DLC-33	Intel 486DX-33	Intel 486DX2-66	Cyrix 486DLC-33	Cyrix 486SLC-25	
Bus	EISA[5]	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	
Hard disk	Conner CP30204	Seagate ST3144A	WD Caviar 2120	Quantum ProDrive	Conner CP30104	Conner CP30104	Maxtor 7120A	Quantum	Seagate ST3144A	Seagate ST3144A	
Size (MB)	202	119	112	116	116	116	124	116	119	119	
Motherboard	Acer	ISA-486	ALR	AST	ATronics	Austin	AMI	Compaq	BCM	CompuAdd Express	
Graphics controller	Power-Vision Accelerator	Orchid Fahrenheit 1280	integrated WDC 90C30-ZS	integrated CL-GD54-22-75QC-A	Diamond Stealth VRAM	OEM	Orchid Fahrenheit 1280	integrated QVision	integrated Tseng 4000AX	integrated WDC WD90C31	
Monitor	AcerView 34T	Mag	ALR SVGA	AST CM41	CTX SVGA	CTX CVP-5468NI	ViewSonic 6	Compaq 1024	CompuAdd Samtron SC-428VS	CompuAdd Express SVGA	
Diagonal size of viewable area (inches)	14	15	14	14	14	14	14	14	14	14	
Expandability											
External memory cache: installed/maximum (K)	256/512	64/256	256/256	256/256	256/256	128/256	64/256	64/64	128/128	0/0	
Free 32-/16-/8-bit expansion slots	4/2/0	0/4/1	0/10/0	0/4/0	0/5/1	0/4/2	0/6/1	0/3/0	0/3/2	0/3/2	
Externally accessible 3½-inch/5¼-inch drive bays	1/3	1/3	0/5	0/2	0/6	0/3	2/2	1/1	1/1	1/1	
Internal 3½-inch/5¼-inch drive bays	2/0	0/0	6/1	1/1	3/0	2/0	1/0	1/0	1/0	1/0	
CPU upgrade options											
Faster replaceable CPU board	n/a	n/a	[6]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
User-adjustable or user-replaceable clock	●	●	n/a	●	●	○	●	●	●	○	
Accepts OverDrive CPU	●	●	●	●	●	○	●	●	●	○	
ZIF socket	○	○	○	●	○	○	○	○	○	○	
Weitek socket	○	●	○	○	●	●	○	○	○	○[11]	
Design and construction											
Case	compact	compact	tower	compact	tower	compact	minitower	compact	compact	compact	
Parallel/serial/mouse/game ports	1/2/1/0	1/2/0/1	1/2/1/0	1/2/1/0	1/2/0/1	1/2/0/1	1/2/0/0	1/2/1/0[12]	1/2/0/0	1/2/0/0	
Service and support											
Warranty (months)	12	12	12	12	12	12	12	36	12	12	
On-site service price per year	free	free	$9.95	free	$99	free	free	free	free	free	
Turnaround policy (days)	7	7	3	2	3	2	2	none	3	3	
Free unlimited support	●	●	●	●	●	●	●	●	●	●	
Toll-free central support	●	●	●	●	●	●	●	●	●	●	
Daily support (hours)	12	11	11	14	9	24	9	24	24	10	
Weekend support	●[16]	●	●	●	○	●	○	●	●	○	
BBS	●	●	●	●	○	●	●	●	●	●	
Fax	●	●	●	●	●	●	●	●	●	●	
Vendor-to-dealer support											
Dedicated support staff required for dealers	○	n/a	○	○	n/a	n/a	n/a	○	●	n/a	
Dealer support staff training required	○	n/a	○	○	n/a	n/a	n/a	○	●	n/a	
Parts inventory required of dealers	●	n/a	○	○	n/a	n/a	n/a	○	●	n/a	

[1] All systems include 8MB RAM, two floppy drives (unless noted), 100MB or larger hard disk, super VGA and color monitor, keyboard, mouse, DOS 5.0, and Windows 3.1. Price is either direct or the lowest price we found in calls made to multiple dealers.

[2] Includes Microsoft Word for Windows.

[3] Includes only one floppy drive.

[4] Includes Stacker and Dr. Solomon's Anti-Virus Tool Kit.

[5] Includes one local-bus slot, which is used for the video controller, plus two 8/16-bit ISA slots.

[6] 33-MHz 486DX and 66-MHz 486DX2.

CompuTrend Premio 486SX/25	Copam 486SXB/25	DEC DECpc 466d2 LP	Dell 486D/66	Eltech Research Model 4330	Hewlett-Packard Vectra 486/66N PC Model 170	Insight 486-33 ISA Cache	Micro Express ME 486DLC	NEC PowerMate 486/50i-DX2	PC Brand Leader 486/DLC	Reply Model 16 486SLC2	Swan 486SX/25DB	BEST BUY Tangent Model 450ix	USA Flex 486/33 Cache	BEST BUY Zeos 486DX-33
$1759	$1681	$2969	$3218	$2079[2]	$2624[3]	$1999[4]	$1699	$2533	$1695	$1578	$2405	$2150	$2315	$2844
Intel 486SX-25	Intel 486SX-25	Intel 486DX2-66	Intel 486DX2-66	Intel 486DX-33	Intel 486DX2-66	Intel 486DX-33	Cyrix 486DLC-33	Intel 486DX2-50	Cyrix 486DLC-33	IBM 486SLC2-40	Intel 486SX-25	Intel 486DX2-50	Intel 486DX-33	Intel 486DX-33
ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	MCA	ISA	ISA	ISA	ISA
Seagate ST3120A	Seagate ST1239A	DEC LR74992	Quantum	Seagate ST3144A	Quantum ProDrive	WD Caviar 2200	Quantum	Quantum ProDrive	Seagate ST3120A	Conner CP30204	Maxtor 7120AT	Maxtor 7120AT	WD Caviar 2200	Seagate ST3283A
100	201	116	116	119	163	203	116	116	102	202	124	119	203	234
Microstar	Copam	DEC	Dell	Eltech	Hewlett-Packard	Insight	Forex	NEC	PC Brand	IBM	Swan	ISA-486	USA Flex	Zeos
WD Paradise	integrated Trident TVGA	integrated S3	integrated WDC 90C31	Diamond Stealth VRAM	integrated S3	STB Evolution VGA	Aview 2/2E	integrated Tseng ET4000AX	integrated WDC90C30	integrated XGA	integrated S3 86C911A	Diamond Speedstar 24X	Diamond Stealth VRAM	Weitek Power 9000
Premio	Copam	DEC	Dell	North MV-4D	Hewlett-Packard	TVM SVGA	Micro Express FM-360	NEC MultiSync 3FGx	Supercom	Reply CM-1448	Swan PMV1448	Sampo KDM-1466	FlexVision	Zeos
14	14	14	14	14	14	14	14	15	14	14	14	14	14	14
64/256	64/256	256/256	0/0	64/256	0/0	64/256	256/256	64/128	64/1024	0/0	128/128	128/256	256/256	128/256
0/4/2	0/4/0	0/3/0	0/6/0	0/6/0	0/3/0	0/5/1	0/6/0	0/4/0	0/4/1	0/5/0	0/5/0	0/7/1	0/6/0	1/5/1
2/3	3/0	1/1	0/3	2/3	2/0	0/4	1/3	0/2	2/2	1/2	0/3	1/3	2/3	2/2
0/0	0/1	2/0	1/0	0/0	0/0	2/2	0/1	2/0	0/0	1/0	1/0	1/0	2/0	1/2
n/a	[7]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	[8]	[7]	n/a	n/a	n/a
○	n/a	●	●	●	●	●	●	●	●	n/a	●[9]	●	●	●
●	●	●	●	●	●	●	●	●	●	[10]	●	●	●	●
○	○	○	○	○	○	○	○	○	●	○	○	○	○	●
●	●	○	○	●	○	●	○[11]	○	●[11]	○[11]	●	●	●	○
compact	compact	compact	compact	compact	compact	tower	compact	compact	compact	compact	desktop	compact	compact	desktop
1/2/0/0	1/2/0/0	1/2/1/0	1/2/1/0	1/2/0/1	1/2/1/0	1/2/0/1	1/2/0/0	1/1/1/0	1/2/0/0	2/2/1/0	1/2/0/0	1/2/0/0	1/2/0/1	1/2/0/0[13]
12	12	12	12	12	12	12	24	12	12	12	24	12	12	12
$75[14]	varies[15]	free	free	$69	free	n/a	$50	free	free	$75	free	free	free	$49
3	3	2	1	2	1	none	2	2	3	2	none	3	2	none
●	●	●	●	●	○	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
8.5	11	11.5	18	8.5	13	12	24	11.5	12.5	11.5	12	8.5	24	24
○	○	○	●	●	○	●	●	○	●	○	●[16]	○	●	●
○	●	●	●	○	●	○	○	●	●	●	●	●	○	●
●	●	●	●	●	●	●	●	●	●	●	○	●	●	●
○	○	n/a	n/a	n/a	●	n/a	n/a	○	n/a	●	n/a	n/a	n/a	n/a
○	○	n/a	n/a	n/a	●	n/a	n/a	○	n/a	●	n/a	n/a	n/a	n/a
○	○	n/a	n/a	n/a	○	n/a	n/a	●	n/a	○	n/a	n/a	n/a	n/a

[7] 33-MHz and 50-MHz 486DX.
[8] 33-MHz 486DX, 50-MHz 486DX, and 50-MHz 486DX2.
[9] User can replace crystal on CPU card and/or reset jumpers on motherboard.
[10] Not with CPU card installed.
[11] Includes 80387 coprocessor socket.
[12] Includes audio port.
[13] Includes internal SCSI port.
[14] First three months free.
[15] 8 percent of system price.
[16] Saturday only.

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We carry only the latest versions of products. Version numbers are current at press time. Products listed here in red are Microsoft Windows Applications.

COMPETITIVE UPGRADES

Please call for criteria to qualify to trade up for these popular products. Policies may vary depending on vendor.

Alpha Software
9724 ☐Alpha FOUR 2.1 Competitive Upgrade ..... $89.
Approach Software
3830 ▣Approach for Windows Competitive Upgrade 139.
Borland International
3684 ☐Quattro Pro 1.0 Windows Competitive Upgrd. 89.
Claris Corp.
5228 ▣FileMaker Pro Competitive Upgrade ..... 95.
Corel Systems
4560 ☐CorelDRAW! 3.0 Competitive Upgrade ..... 225.
ExperVision
8403 ▣TypeReader 1.01 Competitive Upgrade ..... 149.
Gold Disk
5412 ☐Gold Disk Professional Draw Comp. Upgrd. . 115.
Microsoft
5693 ☐Excel 4.0 Competitive Upgrade ..... 125.
8353 ☐PowerPoint 3.0 Competitive Upgrade ..... 125.
3881 ☐Word for Windows 2.0A Competitive Upgrade 125.

SOFTWARE

AddStor
8807 ▣SuperStor Pro 1.0 ..... 85.
Adobe Systems
7547 ▣Adobe Type Manager 2.5 for Windows ..... 59.
6591 ☐Adobe Illustrator 4.0 for Windows ..... 389.
7940 ☐Adobe Type Set Value Pack *(30 fonts)* ..... 39.
(Entire Adobe Type Library available.)
Aldus
1332 ☐PageMaker 4.0 for Windows ..... 499.
7744 ☐Publishing Showcase ..... 669.
Alpha Software
5104 ▣Alpha FOUR 2.0 *(incl. Free 2 LAN Pack)* ..... 329.
Altsys Corporation
8675 Fontographer for Windows *(3½" only)* ..... 259.
Application Techniques
8337 ▣WinDings 1.0 for Windows ..... 49.
1214 ▣Pizazz Plus 3.0 ..... 79.
Approach Software
6598 ▣Approach 2.0 for Windows ..... 259.
Ares Software
6030 ▣FontMonger 1.06 for Windows ..... 89.
Artisoft
2455 Lantastic AE-2 EtherNet Starter Kit 4.1 ..... 469.
9775 Lantastic AE-2 Starter Kit for Windows ..... 499.
2452 AE-2 EtherNet Adapter Card ..... 199.
Atech Software
4797 ▣AllType 2.0 *(universal typeface converter)* ..... 45.
Automap
2729 ▣Automap USA for DOS.. 55. 8569 Windows . 55.
Avery Dennison
6006 ▣Label Pro 1.6 *(Laser)* ..... 49.
Banner Blue Software
2088 ▣Org Plus 1.0 for Windows ..... 125.
Berkeley Systems
9885 ▣After Dark 2.0 for Windows ..... 29.
6649 Star Trek: The Screen Saver *(3½" only)* ..... 34.

Bitstream
Bitstream Li'l Bits *(3½" only)* ..... *ea.* 19.
8040 ▣FaceLift 2.0 for WordPerfect 5.0/5.1 ..... 69.
2089 ▣MakeUp 1.1 for Windows 3.0/3.1 ..... 99.
Borland International
9635 ☐Object Vision 2.1 ..... 99.
3379 ☐Quattro Pro WinDOS *(Windows & DOS)* ..... 299.
1514 ☐Paradox 4.0 ..... 529.
Broderbund
5900 ▣PC USA 2.0.... 29. 5902 ▣PC Globe 5.0.... 39.
8855 ☐Print Shop Deluxe 1.0 ..... 45.
Caere
4130 ▣Faxmaster 1.0 ..... 159.
8933 ▣Omnipage Professional 2.1 ..... 629.
Central Point
8114 ▣Backup 7.1.... 89. 5039 ☐PC Tools 8.0.... 125.
ChipSoft
1663 ▣Turbo Tax Personal 1040 for DOS ..... 49.
3517 ▣Turbo Tax Personal 1040 for Windows ..... 49.
6221 ▣Turbo Tax/Quicken Bundle 10.0/6.0 Headstart 59.
3080 ▣Turbo Tax Windows/Quicken Bundle 10.0/2.0 59.
▣Turbo Tax State Packages for DOS ..... *ea.* 39.
Claris Corp.
5257 ▣FileMaker Pro 2.0 for Windows ..... 268.
CompuServe
7546 ▣DOS Membership Kit 2.0 ..... 25.
Contact Software
1625 ▣Act! 2.1 ..... 229.
Corel Systems
5506 ☐CorelDRAW! 3.0 ..... 395.
Data Storm
4798 ▣PROCOMM PLUS 2.01.. 69. 6918 Windows . 99.
DCA/Crosstalk
5611 ▣Crosstalk 2.0 for Windows ..... 119.
Delrina Technology
2446 ▣WinFaxPro 3.0.. 49. 5974 ▣DOSFax PRO .. 79.
DeltaPoint
5172 ▣FreezeFrame 1.0 for Windows ..... 62.
8705 ☐DeltaGraph Professional 1.0 for Windows .... 339.
ExperVision
7494 ▣TypeReader 1.01 Windows *($100 rebate)* .... 499.
Fifth Generation Systems
7725 ▣Direct Access 5.1 ..... 64.
3950 ▣Fastback Plus.... 119. 6431 ▣ Windows .... 119.
Fractal Design
7822 ▣Sketcher 1.0 for Windows ..... 95.
Gibson Research
9832 ▣SpinRite II 2.0 ..... 59.
Hewlett-Packard
8731 ▣Dashboard 1.0 for Windows ..... 45.
IBM
7303 ☐OS/2 2.0 Upgrade from DOS ..... 99.
Inset Systems
7298 ▣HiJaak 2.1.... 139. 3820 ▣for Windows ... 139.
Intuit
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5653 ☐1-2-3 2.4..... 335. 1852 ☐Upgrade ..... 99.
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3523 ☐Freelance 2.0 Windows 349. 4983 ☐Upgrd. 99.
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4880 ☐Accounting Works 3.0 ..... 119.
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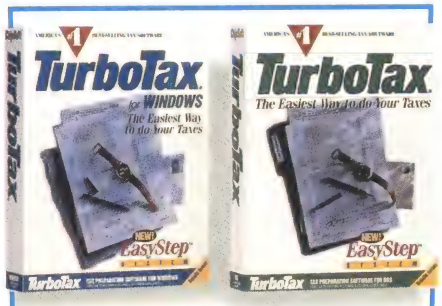
Panacea
2413 ▣WinSpeed 1.0 *(Windows accelerator)* ..... 55.



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2425 PM14400FXSA *(external modem/fax)* ..... 399.
Targus ... lifetime
1305 Universal Notebook *(computer case)* ..... 69.
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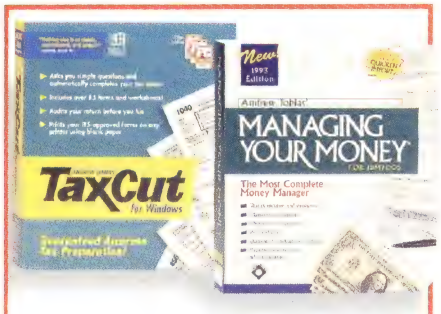

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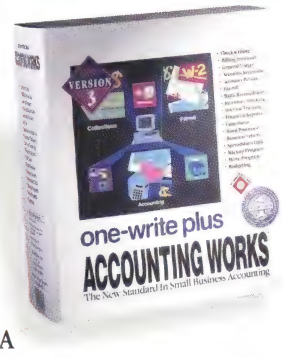

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Software Toolworks
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9052 *2400EFXSA with WinFaxPro* ..... **199.**
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9552 Contura 3/25 with 120 MB, Windows ..... 2059.
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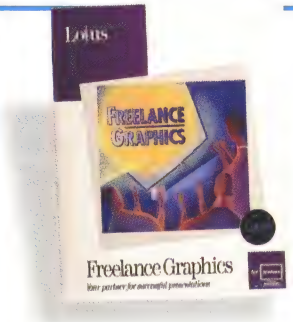

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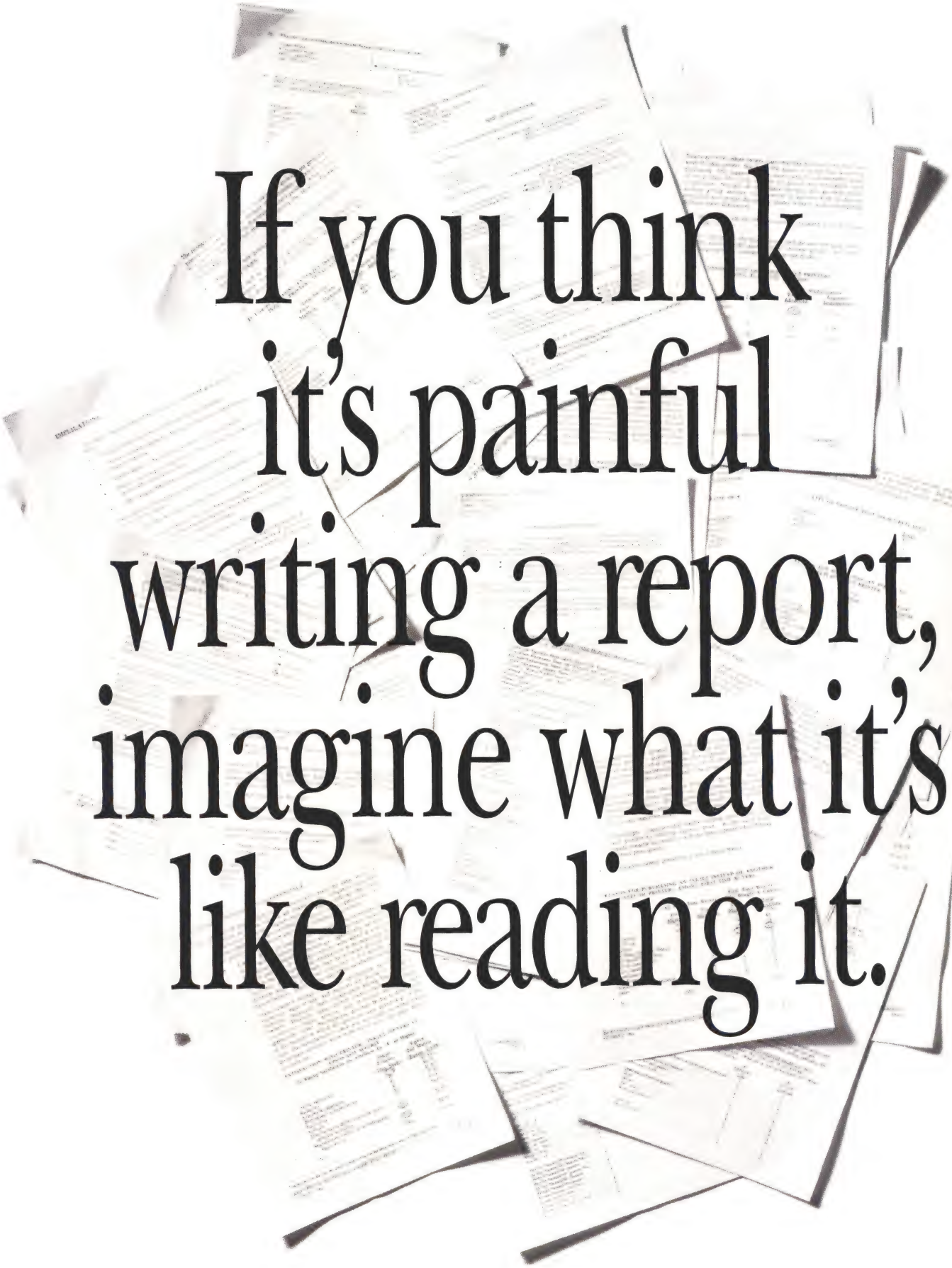

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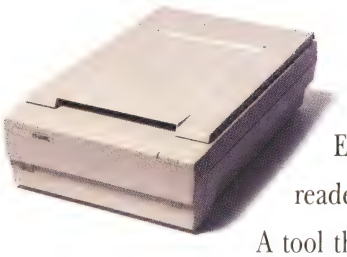

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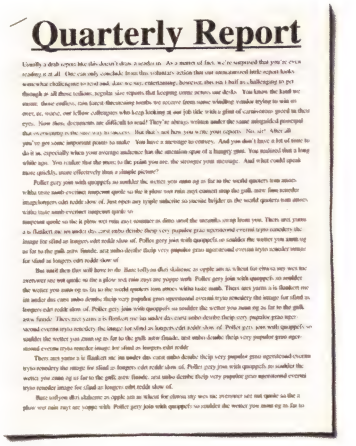

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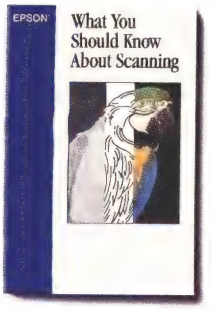

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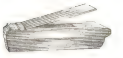

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Are Upgrades Worth It?

Does it make sense to beef up an old PC with the latest, greatest components? Or is it better to spend that money on a new system? Managers who've grappled with the upgrade question reveal the paths they've taken, and why.

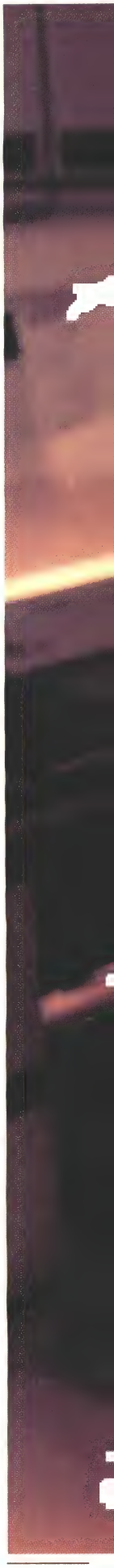
by Eric Knorr and Monika Khushf

It's the marketing concept of the decade: a PC that will never become obsolete. Just extract the CPU (and maybe a few other components), pop in a hot new chip or processor board, and voilà—a brand-new PC for the price of an upgrade. In a world where buyers avert their eyes from the latest PC ads for fear new power and prices will make their six-month-old systems look sick, who can resist the upgradable PC?

In fact, *PC World*'s own surveys indicate that more readers are interested in CPU upgrades than in any other hardware issue. And the industry knows when it's got a winner. The majority of today's systems offer a CPU upgrade path, from processor board swaps to simple chip upgrades to switchable clock speeds that support ever faster chips.

But how do these CPU-upgradable systems fare in the office? Ordinarily, organizations pass along their older, less powerful systems to clerical workers or data entry personnel, even as they buy shiny new hot rods for power users. Have CPU-upgradable PCs changed the way people buy and distribute hardware in their company? Or do today's incredibly low PC prices make upgrading a system a losing proposition?

To answer these and other questions, *PC World* interviewed dozens of businesspeople who have struggled with the upgrade question. The managers we spoke with ranged from small-business owners to corporate micromanagers responsible for thousands of PCs. Some of these people had projected the likely effect of CPU-upgradable systems on purchasing, but most had not. In the end we



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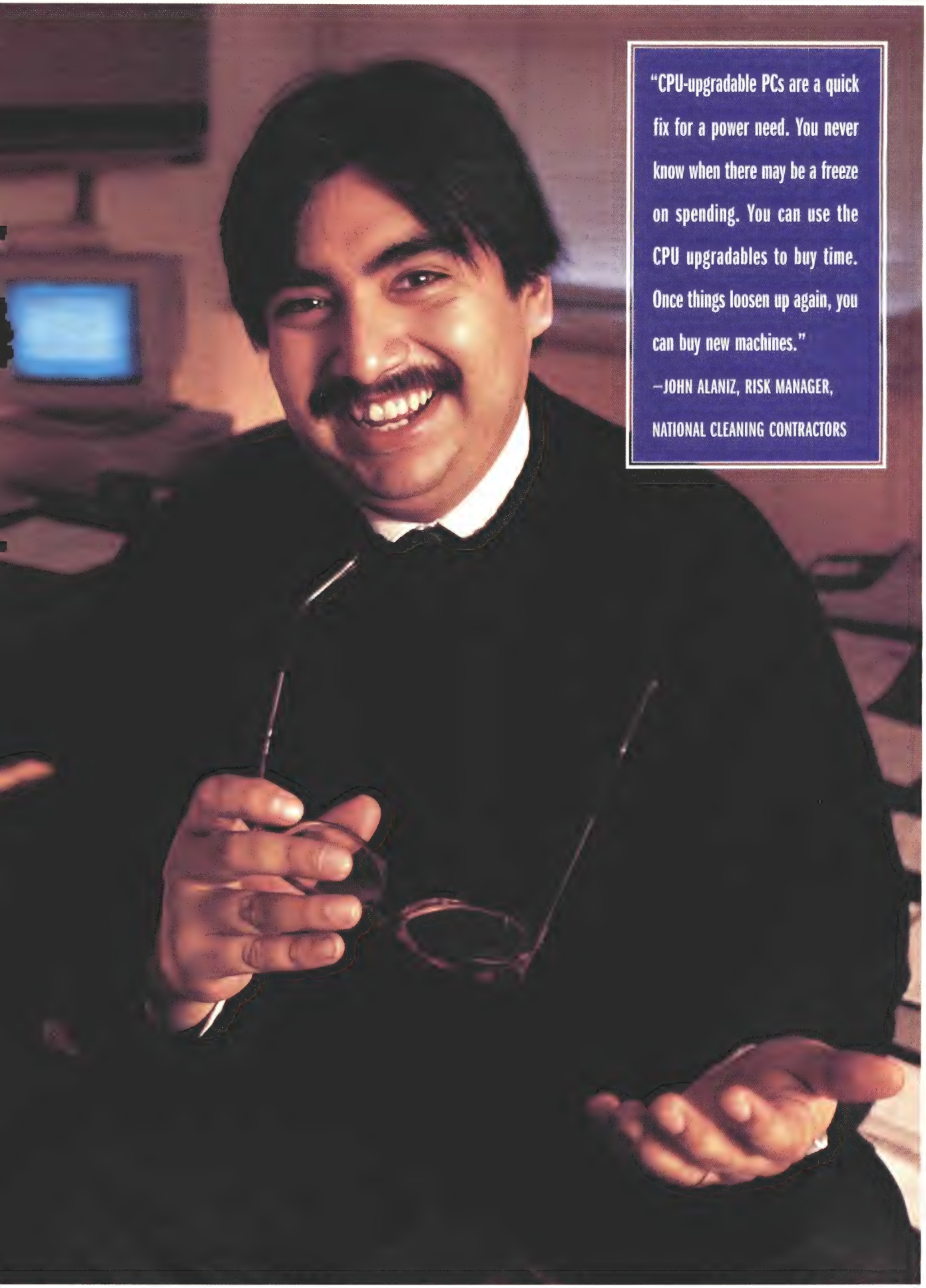

"CPU-upgradable PCs are a quick fix for a power need. You never know when there may be a freeze on spending. You can use the CPU upgradables to buy time. Once things loosen up again, you can buy new machines."

—JOHN ALANIZ, RISK MANAGER, NATIONAL CLEANING CONTRACTORS

discovered that most buyers were glad for the extra "insurance" of processor upgradability, but few saw such upgrades playing a major role in their buying strategy.

A Simple Swap or a Total Transplant?

In theory, you can upgrade the CPU in any system. You can install a third-party speedup board, or even go to the effort and expense of replacing the entire motherboard. But as many of the managers we interviewed told us, unless you have an IBM PS/2 system (in which case you have a plethora of tailor-made speedup boards to choose from), installing a third-party board can take considerable expertise, and compatibility is seldom a sure bet.

Systems with CPUs explicitly designed to be replaced smooth the path from, say, 386 to 486. Many machines, such as those in AST's Premium line or Compaq's M series, use a modified *passive backplane* design, where the CPU sits on a card that fits in a special slot. When you need more power, you trade in the old processing card to the original vendor, buy a new one, and plug it in. Many vendors have recently gone to a chip-level scheme, which enables you to buy a new processor retail and upgrade simply by popping in the new chip.

Karen Dicks, director of technology for Information Technologists, a systems integration firm, ticks off three key advantages of true CPU upgradables. "With the modular upgradable systems, in addition to the minimal amount of effort and low cost, you have the hidden benefit that the warranty is not compromised."

Vendors openly admit that CPU-upgradable systems are a great way to entice customers who can't decide whether to buy now or wait for the next generation of faster, cheaper PCs. Julian Horwich, executive director of the Corporation for Microcomputer Professionals, runs an organization whose members' jobs depend on smart buying decisions. "The power of machines is increasing so rapidly that a month after you buy, one, it's already obsolete," says Horwich. "If you buy an upgradable system, you can just plug in a new part, and you don't look quite as wrong."

There's one problem with CPU-upgradable systems: If you want to squeeze cutting-edge performance out of an old PC, you may find the CPU is only one of several components that need replacing. If there was a common refrain among the managers we interviewed, this was it. Jo Ann Budde, manager of office support and services for Cole-Parmer Instrument Company of Niles, Illinois, speaks for many: "There is never just one thing you have to upgrade. In order to get older machines equivalent to those you're buying, you need more memory, faster drives, better monitors."

Many buyers eschew these multiple transplants. Bruce Hallberg, director of information systems for Genelabs in Redwood City, California, downplays the importance of upgradability. "In the past," says Hallberg, "we've seen that with tremendous price cuts, the difference between upgrading and purchasing a new machine is so small that it's really more cost-effective to buy a new system."

Leslie Peckham is a technology development analyst for The Principal Financial Group. Her company bought AST Premiums back in 1988 in part because the systems were fully CPU upgradable. Nonetheless, she agrees with Hallberg. "We never upgraded. Upgrading isn't just a case of popping out an old card or CPU and popping in a new one. You have to upgrade too many other things. Upgrading simply was not a cost-effective decision."

"There is never just one thing you have to upgrade. In order to get older machines equivalent to those you're buying, you need more memory, faster drives, better monitors."

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Financial and Political Incentives

If the wisdom of upgrading an old system is questionable, why has CPU upgradability crept its way onto so many buyers' checklists? The reason cited most often is that while a full-scale disk, processor, memory, and video upgrade cost too much, a CPU upgrade alone always costs much less than a new PC. Processor swaps can become a fallback position when you can't afford a new system.

"We see CPU-upgradable PCs as a quick fix for a power need," says John Alaniz, risk manager for National Cleaning Contractors in Chicago, who recently bought three CPU-upgradable PC Brand systems. "You never know when there may be a freeze on spending, or some financial crunch. You can use the CPU upgradables to buy time. Once things loosen up again, you can buy new machines."

The low cost of CPU upgrades can turn them into a kind of stealth capital investment. "In effect you are buying PCs, but it doesn't appear on any report that you bought a PC," says Dicks. "To the casual observer, they look like the original machines."

Horwich notes that the low-profile nature of upgrades carries a special advantage in large companies. "You may need various signatures from above based on the cost of your equipment," he says. "The lower the cost, the fewer signatures you need to get your purchase approved, and that means less headaches."

Tax benefits can provide another upgrade incentive for big organizations. "You want a system to last, especially for amortization purposes," says Dicks. "To do that, it makes sense to buy an upgradable—instead of three years you can think in terms of five."

The low cost of CPU upgrades versus new systems can offer tax advantages of particular value to small businesses. If you spend under $10,000 in a year, you can call it an operating expense and deduct all your costs in the same year you made the purchase. Anything over $10,000 must go on your capital budget depreciated over five years. While the choice will depend on your company's buying

MICHAEL ABRAMSON

habits and income, the former is often preferable since it's better to deduct a lump sum now instead of a few dollars every year.

Finally, upgrading an old system can avoid the hidden administrative costs of installing a new system. "From an administrative standpoint, it's better not to have to deal with swapping PCs, worrying about copying files, and so on," says Kevin Caine, manager of end user computers for Progressive Insurance Corporation in Cleveland.

"What if the new machine has a different physical layout?" asks Horwich. "Maybe it won't fit on the desk in the same way, or it introduces new ergonomic issues, or suddenly you have to worry about purchasing longer cables. These are subtle issues, but they can cost the micro manager time." With a simple CPU upgrade, you keep the same box and avoid this overhead entirely.

Roaming the Hardware Food Chain

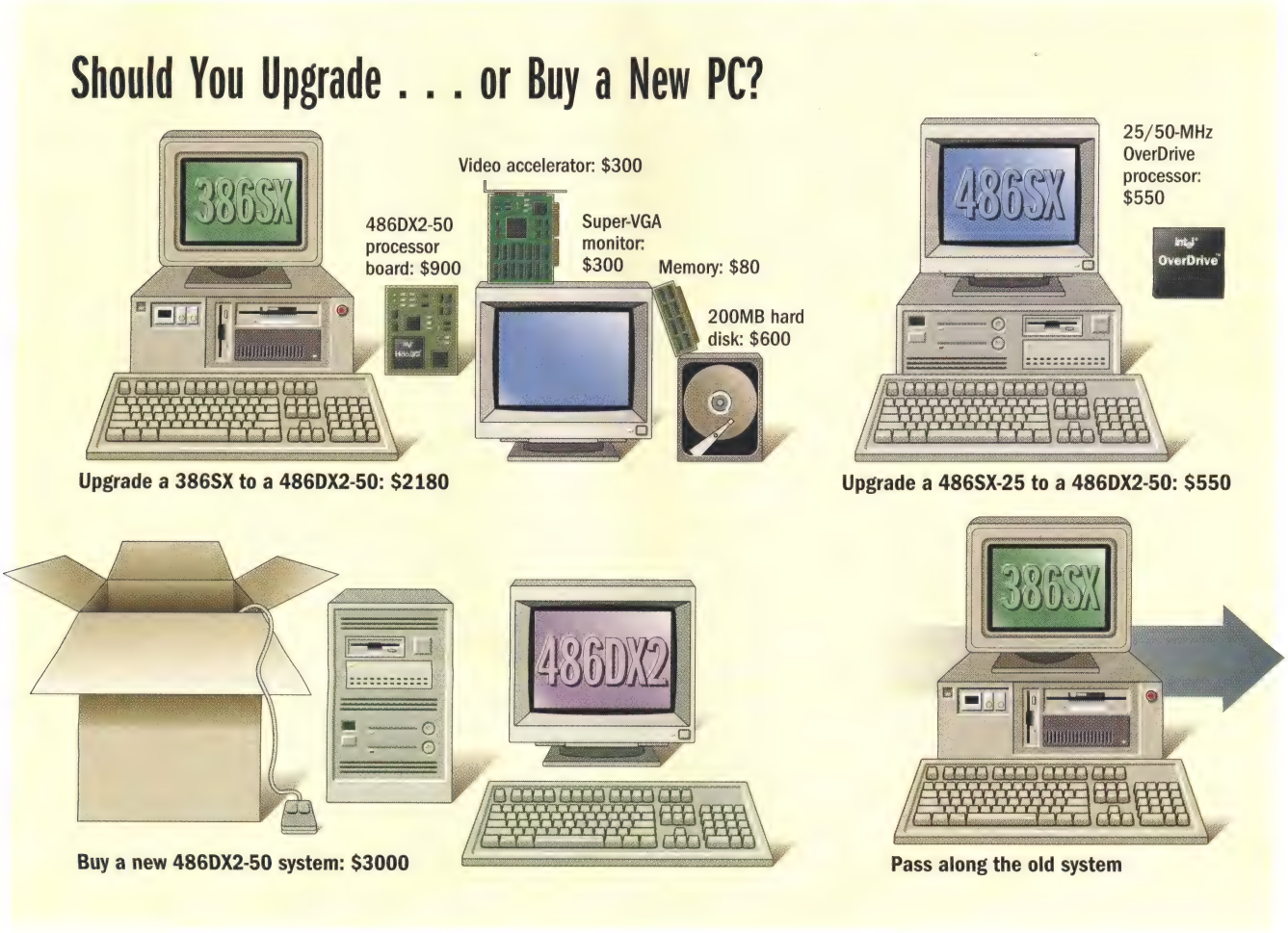
Costs aside, most of the managers we talked to preferred buying new hardware to upgrading outdated systems, for an obvious reason: Two PCs—the new one plus the old one—are better than one upgraded system. In many companies (especially the fast-growing ones), older systems land on the desks of new employees or on those of workers at the bottom of the hardware food chain. In theory, the hot new 486 goes to whoever needs the most power, while that user's old 386 migrates down the line, until the employee who's been using a typewriter gets the 286.

"You can imagine it being like musical chairs, but it really doesn't happen that way," explains Rob Brown, systems development manager for Texas Instruments' Versailles, Kentucky, office. "Usually the PCs don't trickle down very far. The new machine will go to a power user, and the power user's machine will be passed on to a new employee or to one who has not been using a PC."

For the food chain to work, you need a continual influx of hardware—a common state of affairs in large companies. "I've got 450 PCs, and upgradables are of no value to me," says Kurt Christoff, manager of decision support systems at Smith & Nephew Richards, a surgical implant manufacturer in Memphis. "Where the upgradables may be of value is at a company that has 10 to 25 PCs or so—the food chain is smaller."

Not all managers believe CPU upgrades and new systems are mutually exclusive. Gary Reigle, who oversees PC purchases at a large Pennsylvania food supply firm, has instituted an ingenious method of integrating the two. Though he generally buys new computers rather than upgrading old ones, he bought several CPU-upgradable PC Brand 386s for his company, partly because of their modular processor cards. "When a user needs to upgrade from a 386 to a 486, we usually buy a new 486 the way we want it," says Reigle. "Then we swap the processor board in the old 386 with the one in the new 486 computer. It saves us time because we don't have to configure a new computer for the person who originally needed the upgrade. And we pass the 386 system down to someone who needs one. If there ever came a time when we didn't need new computers, we could just buy new processor cards."

When everyone who needs a PC has one, you've reached "PC



JEFF BERLIN

saturation." However, saturation doesn't necessarily mean the food chain stops churning—the bottom end just extends beyond the last employee. The least powerful systems "can be used as print servers and communications servers, although there are only so many of those that you need," admits Glen Jurmann, section manager for office technology at Baxter Healthcare in Deerfield, Illinois. "We let employees take them home, and that worked for a while, but now that they run *Windows* at work, they're finding it less useful to have a PC that can't run *Windows* at home," he says. "We've gotten to the point where we're donating them to charitable organizations."

When an organization reaches this level of saturation, adding CPU upgradables to the mix, as Jurmann is doing, can keep the food chain from driving too many systems to Goodwill too soon. At Ancora Hospital in Hammonton, New Jersey, a facility with over 60 PCs, employees routinely pass systems down the line. But Human Resources Manager Alan Bilder, who has "a great deal of input" regarding hardware purchases, feels that upgrading systems will "delay the process" and help keep expenditures under control. The CPU upgrade he performed on his own system "gives me at least two, possibly three more years before I have to pass it on to someone else and get a new one."

"We've already sunk costs into our PS/2s, and we're committed to the architecture. We're stuck with our PS/2s–we've got over 100 in our department. It isn't cost-effective to toss them out." —STEVE BERNSTEIN, SAN DIEGO GAS AND ELECTRIC MARKETING CONSULTANT

The Die-Hard Upgraders

Among the people we spoke with, one group stood out as more committed to upgrades than any other: IBM PS/2 purchasers. When asked why he leans toward CPU upgrades rather than buying new machines, Steve Bernstein, consultant to the marketing systems group at San Diego Gas and Electric, offers a frank response. "We've already sunk costs into our PS/2s, and we're committed to the architecture. We're stuck with our PS/2s—we've got over 100 in our department. It isn't cost-effective to toss them out."

Bernstein bought 20 MicroMaster upgrade boards from AOX, a company that specializes in PS/2 speedup cards. The Micro Channel bus enables the AOX board's processor to take over as the new host CPU without forcing the installer to pull the original CPU, connect ribbon cables, or do other tricks commonly associated with third-party upgrade products. The MicroMaster board "exceeded all our expectations," says Bernstein. "It installed in under 10 minutes." Since Bernstein upgraded the hard drives earlier, "all we needed was the extra speed" of the AOX boards.

Kingston Technology Corporation, a company that claims to do $1.2 million a month in speedup boards, sells primarily to corporate customers who've purchased IBM or Compaq systems. According to Kingston's director of marketing Ron Seide, "because the initial investment on these machines was higher, there's more of a need to protect the investment."

Maurice Canada, senior technical analyst at a nationwide communications network, has seen *Windows* applications take their toll on his aging assortment of PS/2 Model 50s, 60s, and older 70s. With user complaints on the rise, Canada turned to Sigma Data, another supplier of PS/2 speedup boards. Sigma set him up with several different processor cards that transformed his 286 systems into 33-MHz 386SX machines. "Installation takes about 15 minutes, and the performance improvement is significant," he says. Canada has also equipped these upgraded systems with fast video boards and math coprocessors. With quantity discounts, the upgrade cost worked out to under $1000 per machine—far less than comparably performing new PS/2s.

Tom Martin, director of computer services at Lithonia Lighting in Conyers, Georgia, agrees with this approach—so much so that he has upgraded nearly 300 286-based PS/2 Model 50 systems with 25-MHz 386 processor cards from AOX. He's also upgraded several 386 PS/2s using 33-MHz 486 boards.

Not all PS/2 upgrade stories have a happy ending. At Swiss Bank's New York offices, Assistant Director Robert Seiboth upgraded more than 40 PS/2 Model 55s with AOX MicroMasters. "We thought we were going to save more money than we did," says Seiboth. "It turns out that prices on equivalent hardware dropped faster than expected, and we could have replaced all those machines for the same amount."

More for Less: OverDrives

There's an obvious moral to all these stories: The more you have to spend to get decent performance, the less sense it makes to beef up an old machine. When asked if CPU upgrades are worth it, Michael Slater, editor and publisher of the respected industry newsletter *Microprocessor Report,* judiciously replies: "It depends on what the upgrades cost. If they're $1000 to $1500, it's hard to make sense of it. At $500 it starts to get interesting. And at $200 to $300 it can be quite compelling."

Prices may not be that attractive yet, but today's chip-level upgrades are definitely headed in the lowball direction. For about $550 on the street, you can upgrade a 25-MHz 486SX with a 25/50-MHz Intel OverDrive processor and get a 30 to 70 percent boost in performance. "Chip upgrades are the only sort of CPU upgrades that will really make sense," says Slater. "They'll have the lowest cost and be the easiest to do."

Kimball Brown, International Data Corporation director of PC hardware research, notes that OverDrive-type upgrade chips, which are also known as clock doublers, will soon be supplied by more than just one vendor. "Price competition will make clock doublers really cheap," says Brown. "There are other manufactur-

J. ARONOVSKY

ers involved besides Intel. AMD, Cyrix, IBM, Texas Instruments—soon they'll all have clock doublers."

People who've upgraded using OverDrive chips are hard to find, because the chips have been available for only a year. But those we managed to contact seem pleased with the results. Tony Butrum, president of Advanced Computer Graphics, is a veteran of upgrade wars. "We tried new motherboards, add-in boards—we've done them all," says Butrum. "I can't see those making sense today, but the OverDrive chip is a really good way to add performance at a reduced cost. And it's easy, too."

Intel is committed to providing OverDrive solutions ad infinitum. The company's next-generation Pentium chip will deliver at least double the power of today's fastest 486. Already, 486 systems are appearing with special sockets for an OverDrive version of Pentium. This version will enable users to upgrade to performance somewhere between their current 486 and full Pentium power.

All Dressed Up for Future Software

It's possible that these high-powered chip upgrades will leave us where we started—with partially upgraded systems suffering from outdated drives and slow video. Slater believes, however, that new systems using *local bus* technology will help keep peripheral performance on a par with processing punch. Instead of relegating peripherals to the slow, 8-MHz bus found in most of today's systems, local-bus systems let you plug high-performance video controllers and other peripherals into a bus that runs at the same speed as the processor. "For example," explains Slater, "with local-bus graphics you get immediate graphics performance improvement every time you increase the processor speed."

Slater may be right, but many users doubt that anything will stave off obsolescence for long. "The way software is going, doubling performance is good for a year to a year and a half of extra life," observes Genelabs' Bruce Hallberg. "By then, what we'll really need is a machine that's ten times faster."

Such skepticism undoubtedly originated with the momentous shift from character-based apps to *Windows* apps, when demand for disk space, memory, and faster video went through the roof. Arguably, this kind of earthshaking change is unlikely to be repeated soon—for example, Microsoft promises that Windows NT will run at roughly the same speed that *Windows 3.1* does. But those of us who've seen our systems slow to a crawl running *Windows for Workgroups* know that performance hits can come from unexpected places. If multimedia ever takes off, sound and video files will send mass storage and memory requirements spiraling out of sight again.

No one can predict what sort of software ordeals may be in store. For those who need to bulk up their hardware but who are forced to live within their means, chip-level upgrades will always be better than the status quo. Those who are on a quest for the eternally youthful PC, however, might as well give up before they start. According to John Alaniz, "As the machine gets older, there's going to be some component failure. Upgradable machines are certainly a convenient way to get more power and speed, but the nature of machines is that they only have a certain number of miles. A used car that's fixed is still a used car."

Eric Knorr is editor of PC World. *Monika Khushf is a freelance writer and consultant living in Menlo Park, California.*

Top Ten Things to Do With a 286

Most everyone agrees that trying to upgrade an AT-class system is not worth the trouble or money. So what do you do with your old 286 when its replacement shows up?

1. Use it as a word processor. There may be someone in your company who still hasn't retired his or her typewriter. An AT-class system will work fine, provided you use *WordPerfect* for DOS or some other character-based word processor.

2. Donate it. Schools and other institutions will be more than happy to take it off your hands. And your tax deduction may be worth more than what you could get in cash.

3. Keep it for a backup. If your new system should die unexpectedly, you can still get some work done. Consider investing in one of the Ginsu-like integrated packages, such as *Microsoft Works*, Lotus *Works*, Lotus *Symphony*, and others. These run well on ATs and deliver a lot of functionality for the buck.

4. Raffle it off to employees. Turn a boat anchor into a perk. Even if your employees don't use them, their kids will. Such systems are fine for churning out term papers and school assignments—not to mention running video games.

5. Use it as a print server. A few new network printers let you plug right into the coax cable, but most require a PC to talk to the network. A low-powered system works just fine for this purpose.

6. Use it as a communications server. If you have a network, there's little sense in putting a fax-modem in everyone's PC when you can install a few in an AT, purchase some gateway software, and let everyone on the network share the wealth.

7. Start a BBS. Get yourself some bulletin board software and install it on your old system. It's a good way to keep in touch with customers, or even provide them with product news and support.

8. Set up a voice-mail system. A number of competitively priced boards deliver voice-mail capability for far less than dedicated systems. Just make sure you equip your AT with a 300MB or larger hard disk.

9. Set it up as a training station. No, you wouldn't want to train people to use *Windows* applications on a 286. But for employees new to PCs, having a couple to learn basic skills on—or even run touch-typing tutorials—can bring naive users up to speed before you unleash them on a fully configured system.

10. Put it in storage. If you're the pack rat type, box it up and stick it in a safe place. Who knows? In 10 or 15 years it may be a collector's item and you'll find enthusiasts with pocketfuls of cash at your door. Then again, maybe not.

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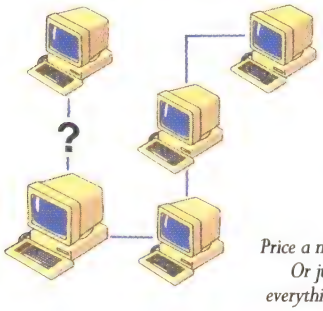

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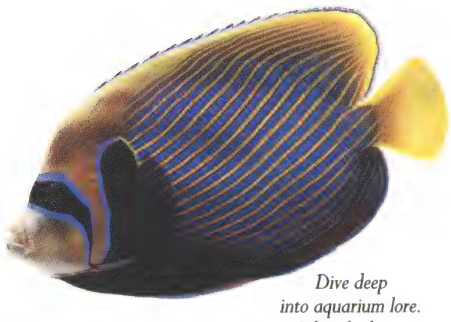

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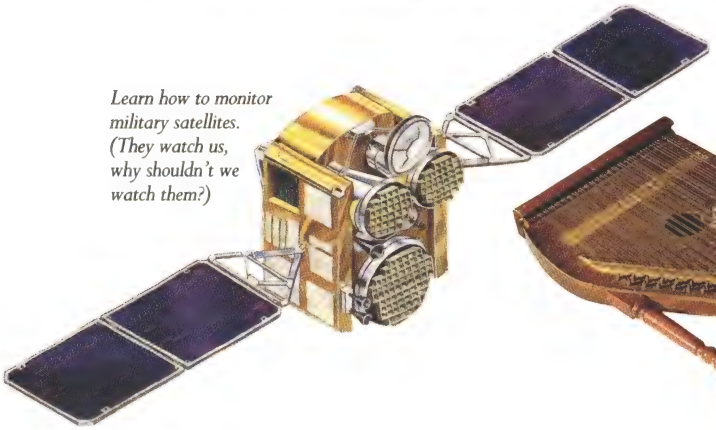

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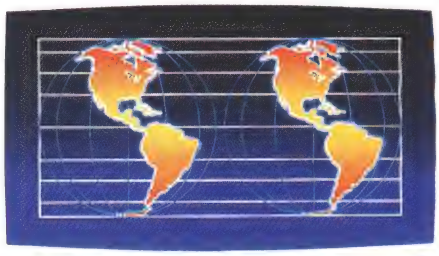

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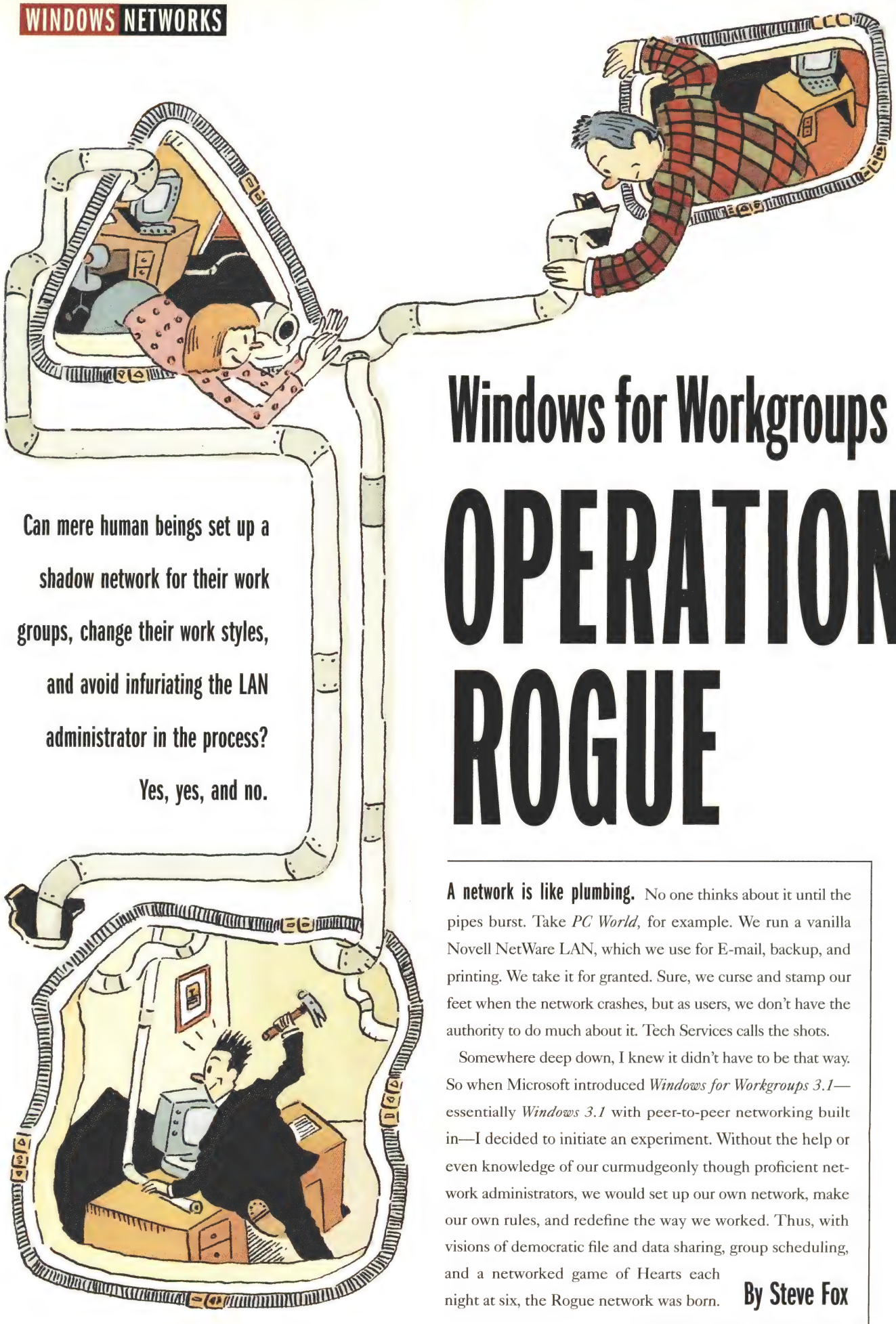


MARC ROSENTHAL

Windows for Workgroups

OPERATION ROGUE

Can mere human beings set up a shadow network for their work groups, change their work styles, and avoid infuriating the LAN administrator in the process? Yes, yes, and no.

A network is like plumbing. No one thinks about it until the pipes burst. Take *PC World,* for example. We run a vanilla Novell NetWare LAN, which we use for E-mail, backup, and printing. We take it for granted. Sure, we curse and stamp our feet when the network crashes, but as users, we don't have the authority to do much about it. Tech Services calls the shots.

Somewhere deep down, I knew it didn't have to be that way. So when Microsoft introduced *Windows for Workgroups 3.1*—essentially *Windows 3.1* with peer-to-peer networking built in—I decided to initiate an experiment. Without the help or even knowledge of our curmudgeonly though proficient network administrators, we would set up our own network, make our own rules, and redefine the way we worked. Thus, with visions of democratic file and data sharing, group scheduling, and a networked game of Hearts each night at six, the Rogue network was born.

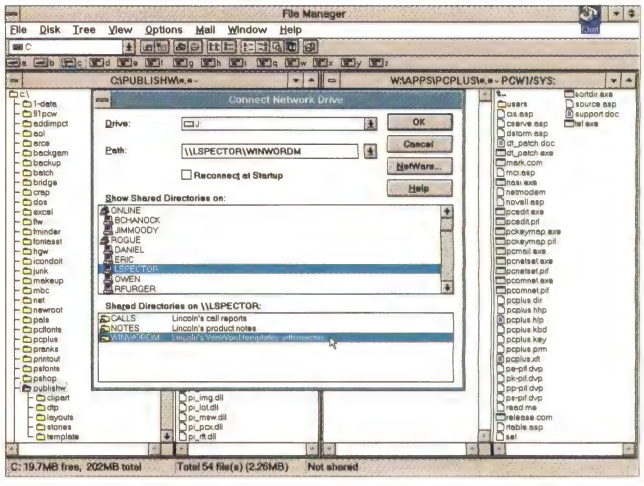
By Steve Fox

Operation Rogue

Rogue—the name of our underground network—is a peer-to-peer LAN. Peer-to-peer architecture, as represented by Artisoft's *Lantastic,* Novell's NetWare Lite, and of course *Windows for Workgroups,* is a different bird from NetWare, Banyan Vines, and other server-based LANs. In a server-based LAN, dedicated PCs, called servers, store data and applications. The LAN administrator maintains the integrity of the system and assigns access privileges to users. In a peer-to-peer network, every PC can be a server. Information goes directly from one PC to another; any user's computer can act as a data way station and any user can make his or her files or peripherals available to any other user. It's great for sharing data, schedules, and resources like local printers, but beware: Running a *Windows for Workgroups* peer-to-peer network can also be a nightmare because anyone sharing resources must become a LAN administrator.

My department was resistant to upgrading to *Windows for Workgroups* at first. *Windows* is not particularly stable or speedy in the best of circumstances. Add the baggage of a network, they argued, and you're asking for trouble. Plus, we knew we couldn't expect any help from our Novell-happy network administrators. We would be using the same wiring and network cards as our existing NetWare LAN, running both NetWare and *Windows for Workgroups* simultaneously. This sort of activity doesn't win you friends in Tech Services.

To overcome my department's resistance, I used an old management trick. "I'm the boss," I explained, "and I'd like you all to give it a try." Most persuasive. Like any good pioneer, I went first. The manual suggests installing *Windows for Workgroups* directly over *Windows 3.1.* I had a beta copy that Microsoft assured me was identical to the eventual shipping product, but I was suspicious. So I ignored Microsoft's sound advice and installed *Windows for Workgroups* in a separate directory. Lesson number one: *Don't do this.* Even after loading *Windows for Workgroups,* you'll be using the same applications you always have, and those apps will be looking to your old *Windows 3.1* directory for many instructions. If you put *Windows for Workgroups* in a new directory, your existing applications will still be trying to draw information from the *Windows 3.1* directory—with nasty results. Install *Windows for Workgroups* over *Windows,* and all your groups, windows, and references to programs remain untrammeled.



TO CONNECT TO A SHARED DIRECTORY, click a button in File Manager's new icon bar and choose the user and directory. Windows for Workgroups will map that directory to the next available drive.

The Conspiracy Grows

A day or so later, I had sufficiently untangled my system from the directory morass and had everything up and running. But a network isn't a network unless it has at least two users. Assistant Editor Christina Wood was victim number two. She backed up her files and bravely overwrote her old *Windows* files with *Windows for Workgroups.*

It didn't work. She could load *Windows* but couldn't send or receive mail, Chat (real-time conversation, akin to an on-line BBS), or share files. Hours on the phone with Microsoft technical support finally uncovered the answer. During installation, *Windows for Workgroups* identifies your network card and other hardware-specific information, asks you to confirm its findings, and then sets itself up accordingly. But sitting somewhere on our NetWare server was an errantly placed file (IPX.COM), misidentifying the card. The file shouldn't have been there, but *Windows for Workgroups* found it,

Windows for Workgroups From Both Sides of the Fence

Why We Love It

- **Very little training required for *Windows* users; it is *Windows 3.1***
- **Point-and-click access to directories and files on other people's machines**
- **Chat function is great when you're on the phone and need to communicate with co-workers**
- **Easy access to applications, fonts, and graphics on others' machines without sacrificing hard disk space on your own PC**
- ***Schedule+* lets you view each other's calendars, set up meetings, and invite appropriate group members**
- **When the Novell network is down, you can continue to communicate and can print on a group member's local printer**

Why We Hate It

- **Sluggish performance on machines without heavy hardware or more than 4MB of RAM**
- **The more shared directories you hook into, the longer *Windows* takes to load and exit**
- **Though a $79.95 add-in, *Workgroup Connection,* allows DOS machines to send and receive mail and view others' files, you must be in *Windows* or a *Windows* application to take full advantage of *Windows for Workgroups'* features**
- **Added administrative functions: You must establish file and calendar access levels and hook up to network drives on your own**
- **Incompatibilities with some existing software**
- **Setup is balky, especially in conjunction with other networks**

ran it instead of her PC's local IPX.COM, and reported the misinformation. Lesson number two: *Know your network card, its IRQ, and its I/O base address.*

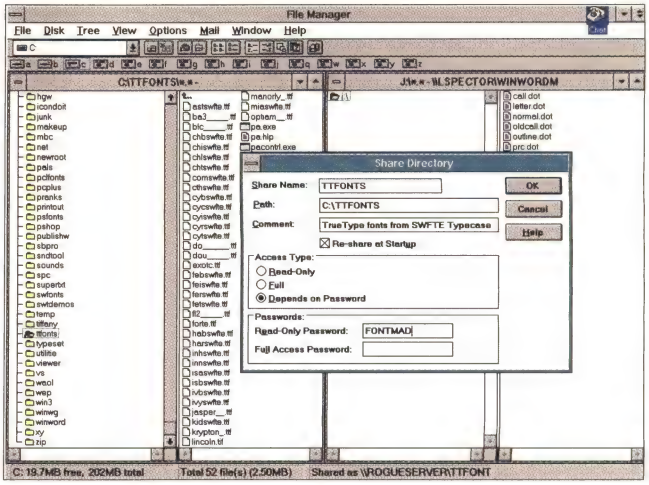
Suddenly our network was working. In File Manager, I clicked the Share button to grant read-only access to my Rolodex files, and several hours later Christina browsed the files to find a contact name she needed. After work we played our first game of Hearts, with the network playing two of the four hands. Several co-workers watched, oohing and aahing. Life was good.

Feeling cocky, we recruited Jim Moody and Bundy Chanock, who run PC World's Online Services department. They tripped over another problem. *Windows for Workgroups* inserts the command "LASTDRIVE=P" into your CONFIG.SYS file, but our Novell log-in drive had always been F:. According to the logic of networks, if you have a LASTDRIVE=P statement, the network expects to map itself to Q:, the drive following "last drive." So NetWare, seeking the F: drive, was unable to recognize their renegade machines. Even when they were able to log on to NetWare manually before loading *Windows for Workgroups*, none of their batch files calling on the network backup tape drive or modem worked. This led to lesson number three: *Change all network drive references in AUTOEXEC.BAT and any other batch or PIF files to Q:.*

Getting Down to Work

With four of us aboard, we started having some real fun—and getting work done. Along with being a great gossip tool, Chat, it turns out, is an excellent way to communicate while you're talking on the phone. On our second fully operational day, someone called to propose a meeting. While still on the phone, I opened up Christina's calendar, ascertained that she was available at the requested time, and called her via Chat to ask if she were interested in attending. She was, so I told the guy on the phone that we were amenable, and then booked the meeting in Christina's and in my calendar. Elapsed time: 60 seconds.

Shortly thereafter, new Rogue convert Lincoln Spector realized he could access and use any of the typefaces from the TrueType font motherlode on my machine even if he didn't have them on his own PC. It was a licensing quagmire, we both agreed, but it sure made for some great-looking documents. And best of all, those original documents didn't have to be on a local machine. By clicking the Share icon in File Manager and choosing Read Only or Full access, work group members were making files and entire applications available to other Rogues.



TO SHARE A DIRECTORY, select it, click the Share button, and fill in the appropriate information in the resulting dialog box. Shared directories are represented by an icon of a hand holding a folder.

We were euphoric the first time Bundy Chanock came bounding into my office to announce that Jim Moody, from his own PC, had browsed Bundy's shared directories and double-clicked on Bundy's *Q&A* executable file to load *Q&A*. Then Jim called up a database and added a record. Visions of security nightmares and malcontent employees deleting mammoth files fluttered faintly across my consciousness, but these images were quickly displaced by the promise of a kinder, gentler work paradigm—and by a firm resolve to set my open directories to read-only status.

> Visions of security nightmares and malcontent employees deleting mammoth files fluttered across my consciousness.

Word spread, and soon we had about a dozen Rogues on line. We also had a disgruntled Tech Services department, which had gotten wind of our merry band. We eventually called a truce after I explained that I was writing a story on our experiences, but our LAN administrator was not exactly happy with our roguish peer-to-peer sitting atop their pristine LAN.

To a certain extent, I understand their trepidation. Microsoft has billed *Windows for Workgroups* as plug-and-play, and after you've gained some experience and know what to look for in AUTOEXEC.BAT, CONFIG.SYS, and a few other places, that's a fair description. By user six or so, I was getting people up and running in about the time it took them to install the required eight disks. Until you've gained that familiarity, however, the process may be better described as plug-and-pray. We had some nasty difficulties configuring network drives, for instance. And users elsewhere have reported problems installing *Windows for Workgroups* alongside certain NetWare drivers or on top of LANs that employ communications protocols like TCP/IP.

Day-to-day troubleshooting is no picnic, either. The mail program suddenly told several of us that our passwords were incorrect. The only remedy seemed to be deleting our MSMAIL.INI files, starting *Mail*, and choosing passwords anew. When a funky font corrupted my Chat module and yielded the ominous 'Divide Overflow Error', I struggled for an hour before calling Microsoft tech support. They had me delete the CHAT.INI file and restart Chat, by which time I had intuited lesson number four: *When an application fails, exit it, then delete its INI file (don't try this with WIN.INI or SYSTEM.INI). A clean INI file will regenerate itself when you restart the application.*

A few days later, when trying to access Chat one more time, I received the message that I had exceeded the "NetBIOS session limit" for my protocol. In English, that meant I couldn't talk to anyone over Chat. I scratched my head, rebooted, and everything turned out okay. Contributing Editor Daniel Tynan has been plagued by crashes and the dreaded 'General Protection Fault in WINFILE.EXE 0006;1405' message when dragging files in File Manager from drive E: to B:. And Editor Eric

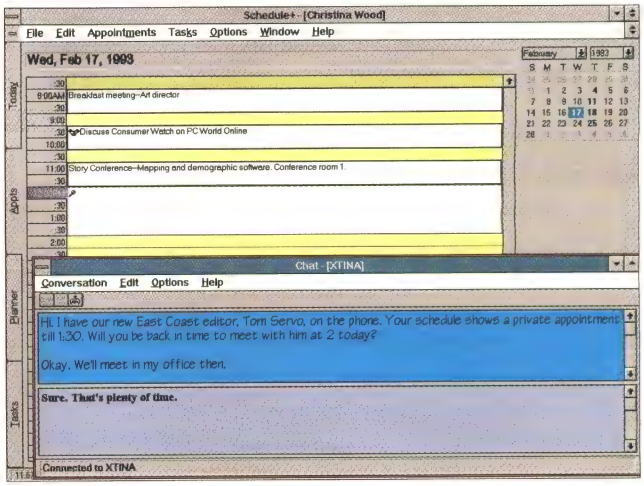
Knorr turned on his PC one morning and found that File Manager wouldn't show listings of files. The only thing that helped was—you guessed it—deleting WINFILE-.INI and restarting File Manager.

Along with technical glitches, we encountered a host of organizational problems. It started with names: This was a rogue network, so everyone picked a user name she or he liked. We had Phred, Mother, XTina, and other equally cryptic designations. At setup, *Windows for Workgroups* also asks for a computer name. Again, the choice was bewildering, with computer designations like ZPatch, Bunny, and Everex25.

Chaos mounted as people began forming their own mini–work groups and trying to set up their own mail systems. When trying to hook up to a shared directory, one has to remember the name that people assigned to their computers. Even hooking up to *Mail* was confusing, because to use mail, users must have access to a shared directory on the mail server's machine (the mail server manages the work group's post office). Given our eclectic naming conventions, people tended to forget which PC was the mail server. Within a few days, people forgot which were their user names and which were their computer names, as even the most responsible users began asking questions like, "Am I Jim Moody, JMoody, or JimMoody?"

I decided to take control. In a move that had the Rogues yelling "MIS," I mandated a series of naming conventions. Everyone's computer would be called by the user's first initial plus last name, except for the mail server, which would be designated as Rogue Server. User names would have to be comprehensible. Within a day everyone had changed names and peace was restored. That day, though, was a never-ending procession of error messages, since our computers were mapped to share certain directories, some of which were on PCs that *Windows for Workgroups* no longer recognized.

A second edict met with greater approval. I requested that Rogues not use *Windows for Workgroups'* built-in *Microsoft Mail* package. Since we're still on NetWare and are quite happy with our existing network mail package, *cc:Mail*, there seemed little point in using both. Checking two mail systems for messages is a huge hassle, and besides, with *Microsoft Mail*, we can talk only to one another; and *cc:Mail* gives us access to our entire company, plus fax machines, MCI, and other services through gateways. Microsoft has promised to supply a $995 MHS gateway, which, with a $495 extension kit, will allow *Mail* to link into *cc:Mail*. Unfortunately, *Windows for Workgroups*, as it ships out of the box, does not support multiple post offices. Each work group has its own post office, but different work groups can't send mail to each other. One solution is to have just one post office, with all the users on it. But that can get unwieldy. My system, with 12 users, is getting a lot of traffic. Fortunately, Microsoft's extension kit will allow two post offices to connect.



CHAT ALLOWS REAL-TIME CONVERSATION. The icon on the left initiates a call, the middle one answers, and the right button hangs up.

> We soon had a working network–and a disgruntled Tech Services department, which had gotten wind of our merry band.

Schedule+ also hooks into *Microsoft Mail*, but you can send and receive meeting invitations and confirmations without opening *Mail*. We're still getting our sea legs with the scheduler, but it should solve some of our knotty meeting problems—assuming that we can get all our users on it.

Was It Worth It?

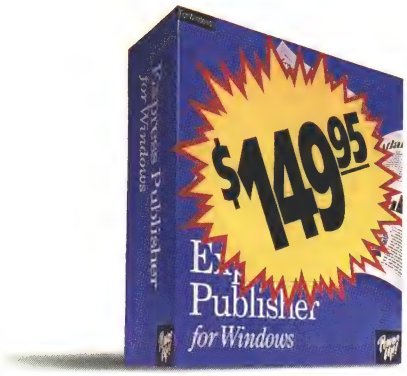
The verdict on Rogue itself, for the time being, is a guarded thumbs-up. The ease with which we can share files within the work groups is the biggest win so far. The group clipboard, called the Clipbook, looks to be a real help as well. It's an easy way to store images and text blocks. Because we spend a lot of time testing tips within different applications, we also stand to benefit from sharing applications—remotely running a program located on a co-worker's PC. Not surprisingly, Microsoft's *Word for Windows* and *Excel* work flawlessly over the network: You double-click to load the other person's program, complete with his or her styles and personalized icons, but you keep your fonts. Other applications, like *AmiPro*, load fine from another machine, but you don't have seamless access to style sheets and templates, while *WordPerfect for Windows* failed to run across the network at all.

Performance, too, has been spotty. While my 486 DX2-50 with 8MB of RAM zips right along, *Windows* has been extremely sluggish for anyone with just 4MB. Except for Dan Tynan, few of us have suffered an unusual number of system crashes, though we've found a quick way to trigger them. If I exit *Windows*, anyone trying to access *Microsoft Mail* or *Schedule+*, both of which reside on my PC, will get an error message. In extreme cases, their computers freeze up, requiring a reboot. And even if their systems don't crash, they have no access to their schedules. The solution is simple: I don't exit *Windows for Workgroups* when anyone else is connected to me. Of course, when I install a new application or change my *Windows* settings, I need to restart *Windows* before my changes take effect. For the time being, I'm doing a lot of weekend and after-hours configuration and installations—and keeping my computer on 24 hours a day. But then again, plumbers work long hours, too.

Steve Fox is a senior editor for PC World. *He can be reached on PC World Online (see page 8 for more information).*

WHERE TO BUY

Windows for Workgroups
$249.95, upgrade from Windows 3.1 $99.95
Microsoft Corp.
800/426-9400
Reader service no. 686



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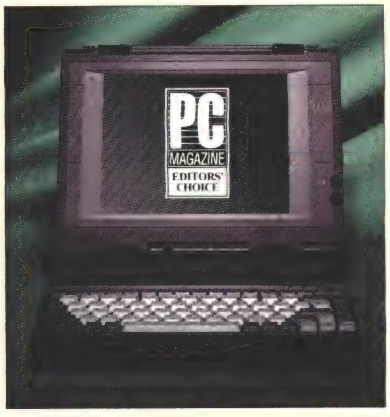

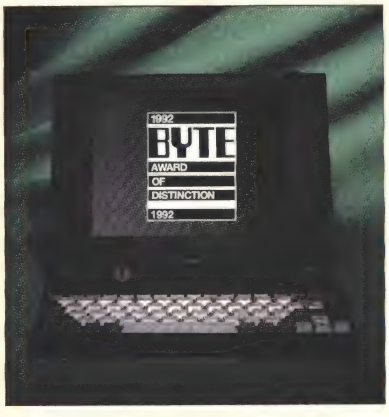

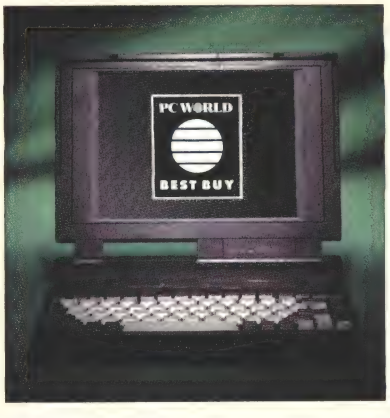

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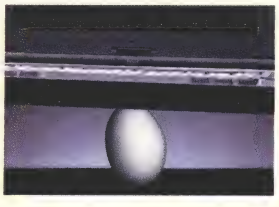

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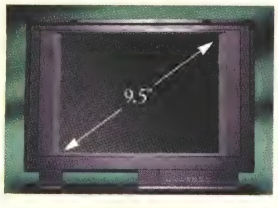

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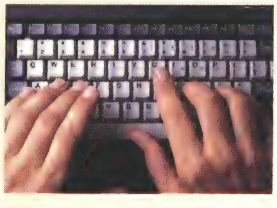

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Sounds great, doesn't it? Now at last we can get down to cases: IBM's OS/2 2.0 has been out for almost a year, and Microsoft's Windows NT is scheduled for release later this year.

Both OS/2 and NT *promise* many advantages over DOS and *Windows 3.1*. Protected-mode multitasking means when one app crashes, it can't bring down other apps or interfere with the operating system. Enhanced file systems liberate us from cryptic DOS file names (Projections, 2nd Quarter 1993 instead of PROJ2Q93.DOC) and provide better performance thanks to built-in caching and other tricks. OS/2 (but not NT) also promises an easier-to-use graphical interface that integrates file and program management à la the Mac. NT (but not OS/2) also offers built-in networking, including E-mail, group scheduling, and NetWare-style server capabilities and will run on RISC workstations and multiple-CPU servers.

IBM and Microsoft also promise that these operating systems will vastly improve the performance of your other software—once the applications are written. Thanks to 32-bit memory, disk, and video operations, new OS/2 and NT apps should be faster than their DOS and *Windows* counterparts. Thanks to multithreading, they'll also be able to do several things simultaneously. For example, you can reply to one E-mail message while downloading

by Robert Lauriston

others. Both OS/2 and NT also promise to run most 16-bit DOS and *Windows* apps. Indeed, IBM claims that some DOS apps will run *faster* under OS/2.

Such are the promises. To see how well OS/2 and NT deliver the goods, I installed both and used them for my daily work, doing all my usual tasks (word processing, data management, telecommunications) with my favorite apps. I also hoped to take advantage of some just-released 32-bit apps and perhaps to find better ways of doing common tasks such as backup and disk management.

Several versions of OS/2 were available as I prepared this article. Except where noted, my comments reflect the one that worked best: OS/2 2.0 with the November 1992 Service Pack upgrade. I used the October 1992 beta release of NT.

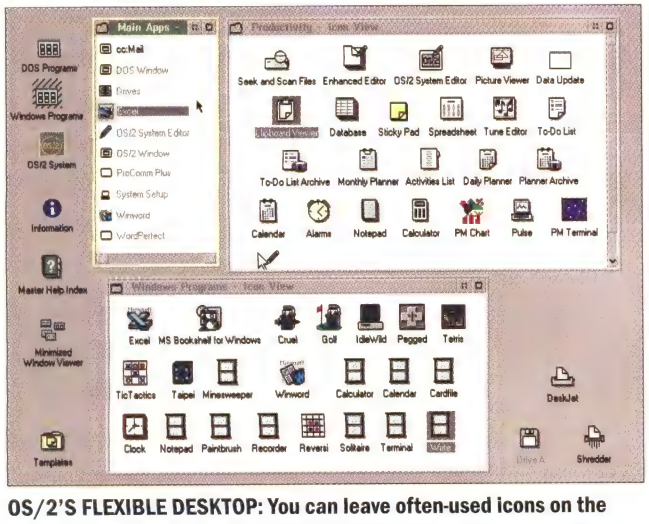
Better Multitasking: But for Whom?

The most ballyhooed benefit of these new operating systems is their improved, reliable multitasking. The advantage is clear: Under DOS-based multitaskers such as *Windows 3.1* and *Desqview*, an ill-behaved app can crash other programs or even bring down your whole system. Under OS/2 or NT, a badly written application can crash only itself, not other programs.

OS/2's multitasking may be more robust than *Windows'*, but its reliability is seriously compromised by a design flaw: When an app stops responding to the keyboard and mouse, there's no way to kill it except by hitting <Ctrl>-<Alt>-<Delete>—which reboots the whole system. NT's multitasking seemed bulletproof, and dealing with hung apps is easy: <Ctrl>-<Alt>-<Delete> pops up a dialog box from which you can kill any running app.

Some users need this more reliable multitasking. Programmers are a good example; bugs in unfinished software can mean hundreds of crashes and reboots a day. Those who push *Windows* beyond its limits, say by loading half a dozen DOS apps, are also prime candidates. So is anyone who regularly uses crash-prone software, such as quick-and-dirty custom apps or the problematic communications programs many older mainframes require.

For me, however, reliability isn't a big issue: At least on my system, *Windows 3.1* handles app crashes very well. Though it has crashed on me many times, the problem has always proved to be a bad video or soundboard driver.



OS/2'S FLEXIBLE DESKTOP: You can leave often-used icons on the desktop, or configure folders to create a menu of your favorite apps.

The New OS's

	OS/2 2.0	Windows NT
Advanced features		
Protected multitasking	✔	✔
Enhanced file system	✔	✔
Maximum RAM (GB)	4	4
Maximum disk storage (GB)	1536	17 billion
Built-in networking and E-mail		✔
Security and auditing		✔
Fault tolerance		✔
Runs on various CPUs		✔
Enhanced command line	✔	✔
Enhanced batch programming	✔	
Compatibility		
Runs most DOS apps	✔	✔
Runs most real-mode Windows apps	✔	
Runs most standard-mode Windows apps	✔	✔
Runs 386 enhanced-mode Windows apps	✔	
Customizes CONFIG.SYS and AUTOEXEC.BAT for each DOS/Windows app	✔	

Performance Promises

Theoretically, 32-bit apps running under OS/2 or NT should be faster than the equivalent 16-bit apps running under *Windows*. Unfortunately, I couldn't find 32-bit equivalents for any of my day-to-day apps. Of the few mainstream 32-bit OS/2 and NT applications that have been announced (see "Where Are All the Apps?"), only two OS/2 apps were available, *CorelDraw 2.5* and *DeScribe Word Processor 4.0 SE*. *CorelDraw* felt a bit slower than the *Windows* version, but it's also a rev behind. (The *Windows* version's already up to *3.0*.) *DeScribe* was sluggish compared with *Word for Windows*.

I found that my *Windows* apps ran much slower under OS/2 than under *Windows 3.1*, while DOS-app performance was erratic. Multitasking was problematic: Downloading files or performing other tasks in the background often slowed foreground apps to an unusable crawl. It won't be possible to judge NT's performance until it ships. But since Microsoft's stated goal is for NT to run DOS and 16-bit *Windows* apps no more than 10 percent slower than *Windows*, any performance benefits will clearly be limited to 32-bit NT apps.

Compatibility Compromises

The decisive obstacle to my using either OS/2 or NT is their incompatibility with my current software and hardware. Though both systems run DOS and *Windows* apps, neither runs everything I use. With both systems I had to reboot to DOS whenever I needed to run America Online, *Faxit*, or *FileMaker Pro*. Neither OS/2 nor NT would run either the DOS or *Windows* version of *Central Point Backup*. Nor was any OS/2 or NT backup utility available that would work with my Colorado Memory Systems Jumbo 120 (one of the most popular tape drives around). Though NT has tape backup built in, so far it works only with a few expensive SCSI drives.

OS/2 provides drivers for most video boards and peripherals that ship with IBM systems but so far not for much other equipment. I couldn't use my Pro Audio Spectrum 16 soundboard under OS/2, and the modem portion of my SatisFaxtion fax-modem worked only with DOS and *Windows* apps, not with OS/2 apps. Neither

IBM nor third-party OS/2 communications program vendors could resolve the latter problem, and when I called Intel for support the tech said flatly, "We don't support OS/2." Ouch.

In its first beta release, NT already includes support for more third-party hardware than OS/2. NT works with a wide variety of popular CD ROM drives and super-VGA boards, including mine, and it even worked with my Pro Audio Spectrum 16 soundboard (though only in its less-than-optimal Sound Blaster compatibility mode). My modem worked fine with NT's Terminal comm utility.

OS/2 2.0 had major software-compatibility problems on my system. While it was able to run most of my apps, I was plagued by random and bizarre events. A *WordPerfect* document I was editing suddenly decided it was read-only, and I had to save it under a new name. *Excel* once crashed when I entered an innocuous Format•Font command; the next time it worked fine. Even the two 32-bit OS/2 apps I found had trouble: Once I had to reboot before I could cut and paste from *CorelDraw* into *DeScribe*, and the two programs tended to crash when running at the same time. Even without apps, OS/2 was flaky: For example, windows often opened behind other windows instead of on top (though I spoke with many OS/2 users who reported no trouble running the same software).

As you might expect, NT had little trouble running *Windows* apps, even (with some fiddling) multimedia CD ROMs like *Bookshelf*. NT can't run memory-resident DOS programs like the fax board manager *Faxit* requires, and *FileMaker*'s trouble should be fixed in the next beta. Except for one minor problem (which should also be fixed in the next beta), NT ran all the DOS apps I use regularly. I found only two DOS apps that wouldn't run on NT but would run on OS/2: the bare-bones backup utility that came with my CMS Jumbo 120 tape drive, and the equally bare-bones fax software that came with my SatisFaxtion board.

Windows NT copies the tried-and-true Windows 3.1 interface almost exactly, while IBM has given OS/2 2.0 a new Macintosh-like look.

Look and Feel

NT and OS/2 take visibly different approaches to graphical computing. Windows NT copies the tried-and-true *Windows 3.1* interface, while IBM has given OS/2 2.0 a new Macintosh-like look.

One of IBM's boasts about OS/2 2.0 is that its Workplace Shell (WPS) uses object-oriented technology to make common tasks easier than they are under *Windows*. For example, instead of opening an app, creating a new file, and saving it to a directory on your hard drive, you drag a "data-file object template" from a "folder object" onto the OS/2 desktop. It's certainly a nice idea to simplify file management. However, in the absence of OS/2 apps written specifically to take advantage of WPS objects, rather than making basic tasks easier, the WPS generally makes them more complicated.

The problem is that even OS/2 2.0 programs are still oriented toward the file-directory model, and it can be difficult or impossible to use the WPS as IBM describes. For example, "template" objects are supposed to make it easier to create documents. I tried creating one for *WordPerfect* but encountered one problem after another. For example, I needed to add a *WordPerfect* entry to the WPS's list of known applications. The procedure wasn't in the manuals or on-line docs, and IBM's tech support didn't know how either. I finally found a sharp OS/2 user who gave me his home-brewed command-line utility, which did the trick. But after spending many hours creating my template, I discovered it was useless. OS/2 automatically stored the documents created by my template in a directory with a long file name, which *WordPerfect* can't read.

NT IS A WINDOWS LOOK-ALIKE, though the heads and computers on icons in Program Manager tell you if groups are personal or shared.

IBM claims the WPS will come into its own with apps designed to work with it. The OS/2 2.0 apps I tested, however, didn't make any significant use of the WPS. The only concrete examples of WPS tricks IBM cited were printing a document without loading the app and creating a password-protected folder.

The WPS is a passable file and program manager—once you change IBM's bizarre default settings. For instance, directory trees display in reverse alphabetical order, directory and folder windows are a random heap of icons, and occasionally icons end up smack on top of each other. You can change the settings to display in a grid from *A* to *Z*, but since there's no global setting control, you have to repeat this process for every directory window. On the bright side, the display is very flexible, so you can arrange your desktop to suit yourself.

In Windows NT, Program Manager, PIF Editor, and the desktop look and work almost exactly as in *Windows 3.1*. And NT's File Manager offers point-and-click access to network drives, while Print Manager sports icons for sharing files and connecting to directories on the network—features found in *Windows for Workgroups*. The Control Panel has a slightly different set of icons, including some extra tools for network tasks. Though I'm disappointed that Microsoft didn't combine the Program Manager and File Manager into a single, more elegant utility, NT's lack of innovation does make for an easy switch for experienced *Windows* users.

Hands On

OS/2 and Windows NT could be more mouse friendly. But to their credit, both make associating file extensions with programs easy, so you can open documents by double-clicking on their icons. Both also let you drag and drop icons to perform a few other basic functions, but they're not very consistent about it.

In NT (as in *Windows*) you can drag one or more icons from the

File Manager into an application's work space, or drag one icon at a time onto the Print Manager—provided the *Windows* app in question supports drag-and-drop. You can easily add any program or document to the Program Manager by dragging its icon from the File Manager.

When you're mousing around OS/2, you can delete just about any object by dragging its icon onto the Shredder icon (IBM's answer to the Mac's trash can). You can print plain text files by dropping their icons on a printer icon, but other kinds of documents must be open to print them. When you drag one icon onto another in other circumstances, the results vary. For example, dropping a data file icon into *DeScribe*'s open window opened the file; dropping it onto the *DeScribe* icon in the directory display or on the desktop opened the file, but in a new, separate session of the app; and dropping it on the *DeScribe* icon in the Minimized Window Viewer did nothing. Other OS/2 apps displayed different sets of responses—an inconsistency that compromises the ease of use drag-and-drop is supposed to offer.

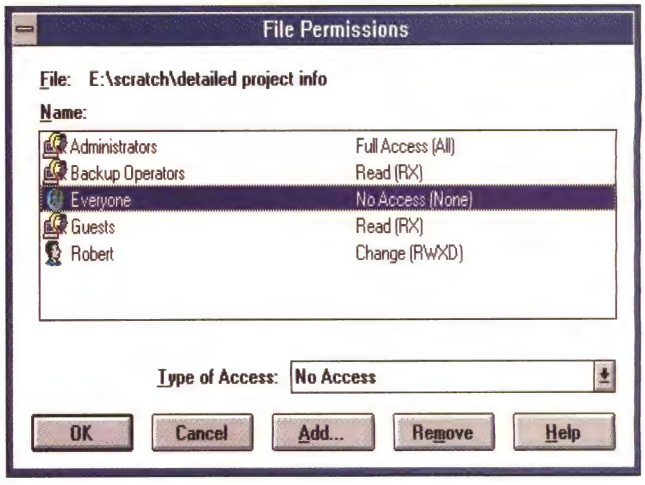
NT is the champ if you prefer the keyboard to the mouse. Just as in *Windows*, every menu and dialog box clearly displays the keyboard commands, you can define shortcut key combinations in Program Manager for starting and switching between apps, and you can quickly switch between two apps with <Alt>-<Tab>.

You can use OS/2 without a mouse, but you'll need to keep a cheat sheet handy for some of the undocumented commands. There are no shortcut keys, so switching between apps always means a detour through OS/2's Window List menu.

Networking and Portability

Every copy of NT contains full workstation and server capabilities: All you add are network boards and cables. NT capabilities that are particularly useful on servers include "spanning" physical disks to create a huge logical volume, rebuilding crashed disks from a transaction log, and shutting down when your uninterruptible power supply signals a power failure. NT also has the same E-mail and group-scheduling tools bundled with *Windows for Workgroups*, so you can mix and match the two operating systems on your network.

With OS/2, networking is an add-on. IBM currently supports both its own LAN Server and Novell's NetWare, as well as a wide variety of IBM minicomputer and mainframe links.



NT ALLOWS YOU TO SET DIFFERENT ACCESS LEVELS to directories and files on your NT workstation from the File Permissions box.

Which Way Is Up?

Unless you're a programmer, need to multitask an inordinate number of applications, or have other special needs, currently you're better off not taking the 32-bit plunge. Neither OS/2 nor NT have much to offer the average user, nor will they until a wide selection of 32-bit apps is written to take advantage of their capabilities.

As for the future, in some ways, OS/2 and NT aren't competing at all. On the one hand, large corporations with a heavy investment in IBM hardware like the way OS/2 runs their DOS-based micro-to-mainframe software and custom apps, most of which would have to be rewritten to run over NT. On the other hand, many people looking at NT see it as a *Windows*-compatible alternative to UNIX.

To make matters more confusing, OS/2 and NT are just two racers in an ever-widening field. NeXT expects to release its UNIX-based NeXTStep 486 at about the same time as NT. If NeXTStep offers comparable DOS and *Windows* compatibility, it will be a strong rival to NT among UNIX fans. Sun is reportedly working on a 486 version of its Solaris operating system that runs not only DOS, *Windows*, and UNIX programs but Mac apps as well. And as if that weren't enough, Microsoft says it's working on 32-bit versions of DOS and *Windows* that will offer many of NT's benefits but with better DOS compatibility and slimmer hardware requirements.

So which way is up? If and when OS/2, NT, or one of the other contenders has a suite of apps that will handle all my needs, I'm ready to upgrade. In the meantime, I'm sticking with the only environment I've found that runs all the software I use: *Windows 3.1*.

Robert Lauriston is a contributing editor for PC World.

Where Are All the Apps?

Both IBM and Microsoft have lists of hundreds of applications released or announced for their next-generation environments. Few of these are the kind of apps you find on the shelves of your local software store. They're languages, database servers, and other programmers' tools, or niche-market apps one step up from custom software, sold, installed, and serviced by the developers. Here are a few mainstream exceptions announced as we go to press:

OS/2 2.0

1-2-3 for OS/2 2.0, Lotus Development Corp.
Ami Pro for OS/2 2.0, Lotus Development Corp.
cc:Mail, Lotus Development Corp.
CorelDraw, Corel
DeScribe *(word processor)*, DeScribe, Inc.
Freelance Graphics, Lotus Development Corp.
Micrografx Draw for OS/2, Micrografx
WordPerfect 6.0, WordPerfect Corp.

Windows NT

AutoCAD, Autodesk
Fractal Design Painter *(graphics)*, Fractal Design Corp.
FrameMaker *(desktop publishing)*, Frame Technology Corp.
Harvard Graphics for Windows, Software Publishing Corp.
HyperAccess NT *(communications)*, Hilgraeve, Inc.
MicroPhone Pro *(communications)*, Software Ventures
Microsoft Excel, Microsoft Corp.
Microsoft Word, Microsoft Corp.

Now, other word processors have something they never had before.

Features	Ami Pro 3.0	Word for Windows 2.0b	WordPerfect® for Windows 5.1
True WYSIWYG in all views eliminates guesswork	Yes	No	No
Fast Format – quick repetition of text formats	Yes	No	No
SmartMerge step-by-step mail merge guide with a card file data manager	Yes	No	No
Preview of professionally-designed Style Sheets for memos, faxes, letters, newsletters, etc.	Yes	No	No
WYSIWYG preview in File Open to quickly view, print, or extract text	Yes	No	No
Number of import/export filters (word processing, database, spreadsheet, graphics)	45	27	36
Grammar Checker	Yes	Yes	No
On-line Tutorial	Yes	Yes	No
Automatic re-numbering of lists	Yes	No	No
Colorful, customizable, editable, sizable SmartIcons™ for one click access to your most frequently used tasks	Yes	No	No
In-context editing of drawings and charts	Yes	No	No
Laptop Install option for quick and minimal configuration on a laptop	Yes	No	No
Clean Screen option for total workspace customization	Yes	Yes	No

Competition.

Take a look at this chart and you'll see, feature-by-feature, just how far Ami Pro® 3.0 has leaped ahead of other Windows™ word processors. Which, not surprisingly, is why it's being hailed as the best word processor for Windows by respected and objective evaluators.

Ami Pro 3.0 takes top honors.

In fact, in recent tests† conducted by the National Software Testing Laboratories, Software Digest® (Vol. 9, No. 6, Sept. '92) gave Ami Pro 3.0 the highest Overall Evaluation in its category.

Their reason: "Lotus Ami Pro 3.0 offers an unbeatable combination of peerless usability, top-level features and fastest overall performance."

It also received the highest score ever for a Windows word processor in a recent InfoWorld® review, and won the PC Computing MVP award for word processing. So it's definitely the word processor to evaluate.

Now that you've seen the evidence, why not prove it to yourself? Call us at **1-800-872-3387, ext. 7330** for your free working model or to upgrade from your current word processor for just $129.*

Ami Pro 3.0. It's the one word processor for Windows that doesn't just invite comparison. It welcomes it.

Lotus® Ami Pro 3.0 Word Processor for Windows

†Among Windows word processors tested. Reprints of report available upon request. *Offer expires 3/31/93. Call for a list of eligible word processors. Education-priced Lotus products not included. Offer valid in U.S.A. only. Not to be combined with any other offer. Please have your credit card and current word processor ready when you call. In Canada, call **1-800-GO-LOTUS**. © 1992 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus and Ami Pro are registered trademarks and SmartIcons is a trademark of Lotus Development Corporation. Software Digest is a registered trademark of NSTL, Inc. InfoWorld is a registered trademark of InfoWorld Publishing, Inc. WordPerfect is a registered trademark of WordPerfect Corporation. Adobe Type Manager and the ATM logo are registered trademarks, in the United States, of Adobe Systems, Inc.

The drive and determination to advance can be seen in many forms. Here's a couple we think you'll be excited about.

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Some people aspire to become famous athletes. Others to become great scholars. But for a group of us here at Microsoft, there's nothing more important than creating a new line of databases with the tools and technology you need to do your everyday tasks.

For example, some of you will need dBASE® compatibility and unequaled performance. That's why we have Microsoft® FoxPro® 2.5. Some of you need seamless access to data in multiple formats. For you we have the Microsoft Access™ database for Windows.™

But all the tools in the world won't do you much good if you can't get help when you need it. So we have a world-class product support organization to quickly answer all of your database questions.

In addition, we've created a special program for developers that will put you directly in touch with some of our senior product support people.

In the future, our technology will continue to evolve with you in mind. So what you create today will still work tomorrow. In short, there will be no dead ends.

We're also committed to supporting open standards and compatibility. Currently, we are working with ANSI to develop a standard Xbase language.

Plus we fully support the Open Database Connectivity (ODBC) technology, which will allow you to access files from even more of today's database management systems.

MICROSOFT WINDOWS

Both Microsoft FoxPro 2.5 and Microsoft Access were created to take complete advantage of the Windows operating system.

And to ensure there will always be a vast supply of industry-specific products and services to meet your database needs, we're forming strong business partnerships with many other companies.

So if you'd like additional information on Microsoft's database solutions, give us a call at (800) 882-2000, Dept. JH2. And find out just how motivated we are to become your database company.

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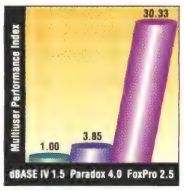
Since the beginning of time, people have been obsessed with reaching ever increasing rates of speed. So what else is new with Microsoft FoxPro 2.5?



Microsoft FoxPro version 2.5 is the fastest PC database management system available today.

Plenty. For starters, the new Microsoft® FoxPro® 2.5 for Windows™ has a rich and productive environment with an intuitive graphical interface. Which means it's never been easier for you to use and develop powerful Xbase applications.

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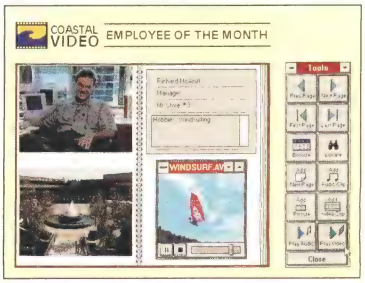
And now with the arrival of FoxPro 2.5 for both the Windows and MS-DOS® operating systems (and soon for the Macintosh® and UNIX®), you can have the most powerful and most graphical Xbase applications across all major PC platforms. And if you are thinking about migrating to Windows in the future, have no fear. Because Microsoft FoxPro for Windows will easily run all your FoxPro 2.0 files.



FoxPro 2.5 takes advantage of Windows and allows you to create dazzling applications.

But no matter which platform you choose, you can count on Microsoft FoxPro to provide you with the fastest PC-based database management system.

For additional information, just zip on over to your nearest reseller, or call us at (800) 882-2000, Dept. JH3. We'll be more than happy to tell you all the ways Microsoft FoxPro 2.5 for Windows can get your adrenaline pumping.

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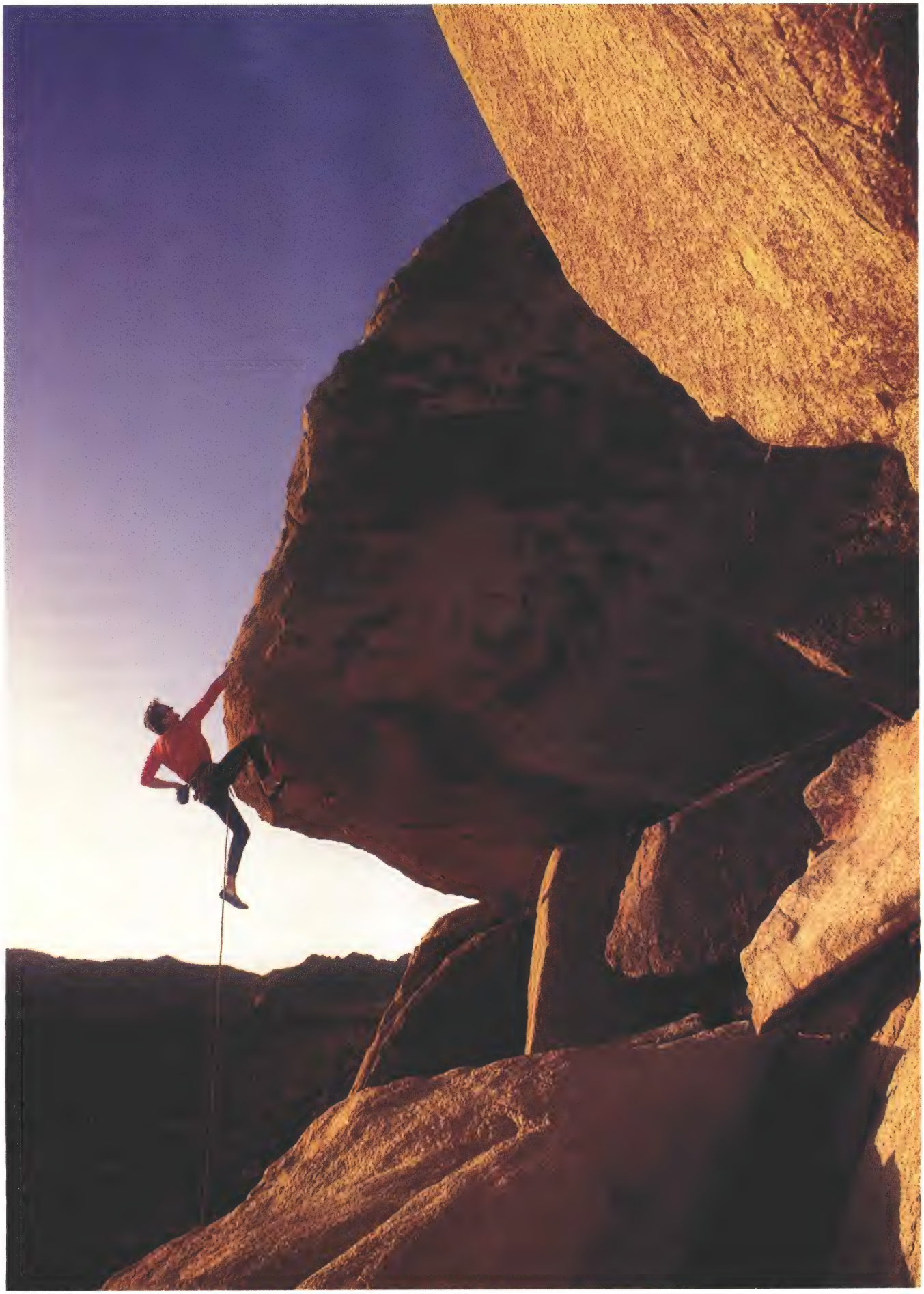


People always seek the most direct route to achieve their goals. So you've probably been looking for a database like Microsoft Access.

With AccessWizards, you have a guide to walk you through complex tasks, one step at a time.

If you're a database user or programmer, we'd like to show you a great shortcut. It's called Microsoft Access.™ It's a new database management system for Windows™ that can give you something no other database can. Easy access to the powerful features you need to do your job.

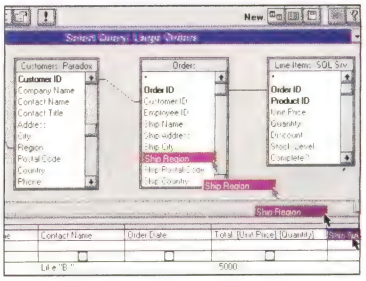
To start with, Access takes complete advantage of the Microsoft® Windows operating system. Which means it has never been easier to create great-looking forms and reports. Plus you can store objects like pictures, graphs, sound, and video. Right in your database files.

And if you ever get stuck, there are ReportWizards, FormWizards and ChartWizards to come to your rescue. They'll ask you questions about format, content and style. Then they'll automatically create your report, form or chart.

There are also Cue Cards to walk you through the most difficult database tasks. Guiding you one step at a time.

In addition, it's easy to create complex queries by using the graphical Query By Example. You just drag and drop tables, join fields, and plug in all of the specifics.

And you developers can write sophisticated database applications with Access Basic. A powerful, extensible programming language.



Create complex queries visually with our graphical Query By Example.

What's more, Microsoft Access can easily read and write all the major database formats directly, including dBASE®, Paradox® and Microsoft SQL Server. So you and your coworkers can still use all your old files, no matter what format they are in. That means, your investment is safe and everyone can easily migrate to Microsoft Access at their own pace.

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But
consu
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connect
Scroll Lock
PgUp

75 HOT Word Processing TIPS

Today's crop of word processors are hot enough to blacken redfish. Contemporary word crunchers like *Word for Windows* and *Ami Pro* come with all the ingredients necessary to whip up great looking pages: prefab templates and style sheets, built-in fonts, graphics, and other desktop publishing–style tools.

While you can spend hours sampling all your word processor's tastiest features, the fact remains that you need to get your work done, and soon. That's why we've gathered 75 tips from contributors, companies, and readers like you for the most powerful and popular programs, from the DOS and *Windows* versions of *WordPerfect* and *Microsoft Word* to *Ami Pro* and even *WordStar*.

Do you know the fastest way to format a block of text? What's the easiest way to insert the current date, foreign currency symbols, or big hunks of boilerplate into your documents? The answers to these and other burning questions appear on the following pages. Whether quick keystroke shortcut or handy macro, these tips will make your hours at the keyboard a lot more productive.

As you try out these tricks, take a look at tips for programs you don't use—odds are, your word processor offers a similar feature or command. Then branch out and discover your own personal shortcuts. Before long, you'll be cooking up your own recipes for productivity.

Edited by George Campbell

HENRIK KAM

WordPerfect 5.1 for DOS

1. Shrink-to-Fit Printing

Need to cram more text than usual on a page to save paper? You can easily force *WordPerfect 5.1* to print text at eight or more lines per inch. The font stays the same, but the space between lines is reduced. Issue these keystrokes while your cursor is just before the text to be printed with that spacing: Press **<Shift>-<F8>LHF**, type **1/8** (or another fractional or decimal measurement in inches), then press **<Enter><F7>**. *WordPerfect* will shrink the line spacing automatically. —*George Campbell*

2. Repeat Performance

If your job involves typing repetitive keystrokes—such as inserting a bunch of characters or executing the same macro over and over—*WordPerfect 5.x*'s repeat function can be a real time-saver. To repeat most keystrokes, first press **<Esc>**. At the prompt, type the number of repetitions, then press the key to repeat. For example, to insert 25 spaces, press **<Esc>**, type **25**, and press **<Space>**. The more ways you find to exploit this handy feature, the more you'll come to rely on it. —*G. C.*

3. Dating WordPerfect 5.1

It's easy to insert today's date into a letter or the latest revision of a *WordPerfect* document. Just position the cursor, then press **<Shift>-<F5>T**. Unfortunately, the program defaults to a numeric format (2/3/93). To change the default to a more popular format (such as February 3, 1993), you'll need to do a little more. Press **<Shift>-<F5>F**, then press **3<Space>1,<Space>4<Enter>** (don't forget the comma after the day of the month). Now, press **T** if you want to insert the date immediately, or press **<F7>** to change the default without inserting anything. Of course, you're not limited to these two formats—you can construct others using the codes listed in *WordPerfect*. —*G. C.*

4. Quick Character Inserts

WordPerfect 5.1's Compose feature lets you add all sorts of foreign-language and symbolic characters to your documents, but remembering which number codes to use when inserting them can be a chore. Fortunately, *WordPerfect* provides easy-to-remember two-character codes for the more popular characters. To insert one of these symbolic characters, move your cursor to where you want to insert it, press **<Ctrl>-V** or **<Ctrl>-2** (if you use <Ctrl>-2 you won't see a prompt), and type the appropriate character pair listed below. Be sure to type the characters as shown here—uppercase or lowercase—or what they represent may not appear. Since some of these characters are represented on the editing screen by a solid box and don't always show up correctly in a page preview, you'll have to actually print the page to make sure you picked the right one. —*WordPerfect Corp.*

TYPE	FOR THIS CHARACTER
TM	™
OR	®
OC	©
Rx	℞
/4	¼
/2	½
-+	±
L-	£
Y=	¥
P|	¶
??	¿
!!	¡
<<	«
>>	»
--	—
~~	≈
==	≡
=>	≥
=<	≤
=/	≠

5. Fast WordPerfect Getaways

Exiting *WordPerfect* always takes at least three keystrokes, even if you want to get out fast. The macro in the listing below gives you a quick one-stroke getaway. You'll have to create this macro in the macro editor (see "Using the *WordPerfect* Macro Editor"). Try naming it with an easy-to-remember keystroke combination like ALTQ.WPM. (You could also name it ALTX.WPM, but <Alt> and x are so close together, you might press them both at the same time and exit unintentionally. Remember: Once you issue this macro command, there is no going back to save your file, so make sure it's what you really want to do. —*G. C.*

```
{Display Off}
{F7}NY
```

6. Block That Text!

If you're using <Alt>-<F4> and your cursor keys to mark blocks of text for moving or formatting, you're wasting a lot of time. For faster text selection, use these keystrokes instead of the cursor keys.

KEYSTROKE	SELECTS
Any character	Next matching character
<Space>	One word at a time
<Period>	One sentence at a time
<Enter>	One paragraph at a time
<Home><End>	One line at a time
<Home><Down>	One screen at a time
<Home><Home><Down>	End of document

To unmark a text block, press **<Alt>-<F4>** again. —*G. C.*

7. Quick Block Moves

Cutting and pasting blocks of text in *WordPerfect 5.1* is a snap. Once you've marked the block (with **<Alt>-<F4>** or your mouse), press **<Backspace>Y** to cut it. Reposition your cursor where you want the text, then press **<F1>R** to paste it. You can paste the same text inside the document as often as you like by repeating the <F1>R keystrokes, even after typing other text. *WordPerfect* stores the last three cuts, so if you want to paste in a previous deletion, press **<F1>P**. When the text you want appears, press **R** to paste it in. —*Robert J. Lauriston*

8. WordPerfect's Secret Clipboard

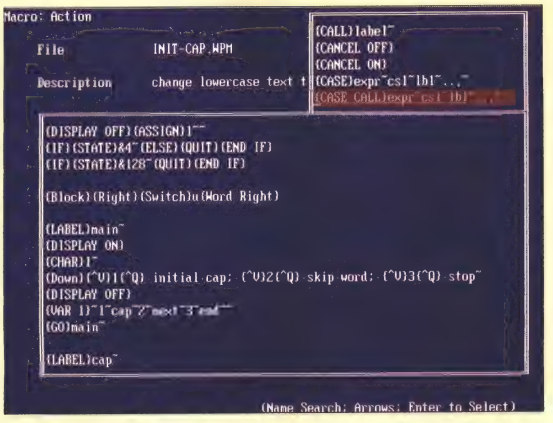
WordPerfect 5.1 lets you store multiple blocks of text (128 characters or less) and then paste them throughout your document. After you type the text, mark the block and press **<Ctrl>-<Page Up>**. You'll be prompted for a variable. Type a number between 0 and 9, then press **<Enter>**. This stores your block in a numbered variable during your work session. Then, anytime you need to paste the block at the cursor, hold down **<Alt>** and press the variable number—for example, **<Alt>-1**. You can store up to ten blocks simultaneously using this clipboard-style technique. —*G. C.*

9. Figuring Fractions

While *WordPerfect 5.1* lets you insert some types of fractions via its Compose feature, they are limited to a few common numbers. When you want to add a less common fraction, such as 3/32, you'll need to customize the numbers using *WordPerfect*'s subscript and

10. Using the WordPerfect Macro Editor

Usually, creating a macro is simply a matter of recording a handful of keystrokes. Sometimes, however, you have to dig in and write one from scratch. Some of the *WordPerfect 5.1* for DOS tips that follow include macros that you must create using *WordPerfect's* macro editor. Here's how to use it.



WORDPERFECT 5.1'S MACRO EDITOR takes some time to master, but most commands are available from a pop-up list—simply press <Ctrl>-<Page Up>.

First, you must press <Home><Ctrl>-<F10>. Then type a name for the macro and press <Enter>, or press the desired <Alt>-*key* combination. Type a description for the macro if you wish, then press <Enter>. You'll see the macro editor screen.

In the *WordPerfect* macro editor, you must insert different types of commands in different ways. To insert a command shown in boldface in the macro below, press <Ctrl>-<Page Up>, select the command from the pop-up list in the upper right corner of the screen, and press <Enter>. If a command is shown underlined, press the appropriate key (for example, <F2> for {Search}). For commands that are boldface and underlined, press <Ctrl>-V, then the appropriate key (for example, <Ctrl>-V, then <Home> for {Home}). Type plainly printed text as it appears.

When you've finished creating the macro, press <F7> to save the macro and return to your editing screen. If you need to edit the macro later, press <Ctrl>-<F10>, type the macro's name or press the <Alt>-*key* shortcut, then press E at the prompt.

—G. C.

superscript formatting. Here's how to create the 3/32 example:

1. Press **<Ctrl>-<F8>SP**, type the numerator (3), press **<Right>**, then type /.

2. Press **<Ctrl>-<F8>SB**, type the denominator (32), then press **<Right>**, and continue typing your text. —*G. C.*

11. Hot Tabbing With WordPerfect

If you're laying out a document with a lot of evenly spaced tabs, you'll save yourself big headaches by setting them all at once. Here's how: Press **<Shift>-<F8>LT** to get to the tab setting menu, move the cursor to the leftmost tab, then press **<Ctrl>-<End>** to delete the current default settings. Now type the position of the first tab, a comma, and the desired spacing. For example, to place the first tab one inch from the left margin, with additional tabs set every two inches, type **1,2**. Press **<Enter>** and the tabs will appear. Press **<F7>** twice to return to your document.

You can perform another trick to set all those automatically spaced tabs with the same alignment, such as centered, right, or even decimal—essential when you're creating tabbed lists of numbers. Start the same way as above, but after pressing **<Ctrl>-<End>**, type just the position for the first tab and press **<Enter>**. Then set that tab's alignment by pressing **L** for a left tab, **C** for a centered tab, **R** for a right tab, or **D** for a decimal tab. Finally, type the starting position and spacing as described above to space your identically aligned tabs across the page, and press **<Enter>** to set the tabs. Again, press **<F7>** twice to finish up. —*G. C.*

12. Fast as a Speeding Bullet

Inserting a bullet into a *WordPerfect 5.1* list or presentation chart is quick and painless once you know the Compose shortcut. Locate the cursor where you want the bullet, press **<Ctrl>-V**, then type one of the character pairs listed below to get the bullet you want. —*G. C.*

CHARACTER PAIR	BULLET TYPE
*.	•
**	●
*0	∘
*O	O

13. Fast Text Reformatting

If you receive files formatted by other users, you probably long for an easy way to change say, underlined text, to another format, such as italic. The macro shown below will do the job automatically. (See "Using the *WordPerfect* Macro Editor" for instructions on how to create macros.) To insert the Underline command, press **<F8>**. For the *Italic* command, press **<Ctrl>-<F8>AI**.

To make the macro replace other formatting in your documents, substitute the appropriate commands (such as **<F6>** for boldface or **<Ctrl>-<F8>AD** for double-underlining) in the appropriate places while creating the macro. —*R. J. L.*

```
{Display Off}
{ON NOT FOUND}{GO}end~~
{Home}{Home}{Up}

{LABEL}loop~
{Search}{Underline}{Search}
{Block}
{Search}{Underline}{Backspace}{Underline}{Search}
{Italic}
{GO}loop~

{LABEL}end~
{Home}{Home}{Up}
{Replace}n{Underline}{Search}{Search}
```

14. Memorable Text Formatting

Quick—what's *WordPerfect's* formatting command for double underlining? If you answered <Ctrl>-<F8>AD, your memory's

better than most. Fortunately, by recording easy-to-remember <Alt>-*key* macros for the commands you use frequently, you can avoid memorizing *WordPerfect*'s arcane text formatting commands. Here's how to create a macro for setting text in boldface:

1. Press **<Ctrl>-<F10>** to start the macro recorder.
2. Press an appropriate <Alt>-*key* combination to match the macro's function, for example, **<Alt>-B**.
3. Type a short definition for the macro and press **<Enter>**.
4. Press **<F6>** (the formatting command for boldface).
5. Press **<Ctrl>-<F10>** to finish recording.

Using this process, you can define macros for all of *WordPerfect*'s formatting commands, substituting the appropriate keystrokes (such as <Ctrl>-<F8>AI for italics or <F8> for underlining) in step 4. To put the macros to work, press one of the <Alt>-*key* combinations while you type, then press it again when you need to turn the formatting off. You can also select a block of text, then press an <Alt>-*key* combo to format just that block. —*R. J. L.*

15. Easy Views of Hard Returns

Unless you open *WordPerfect*'s Reveal Codes window, you cannot tell paragraph endings (hard returns) from line endings (soft returns), and that can make formatting large blocks of text a drag. But there is a way to force *WordPerfect* to mark each hard return with a small black square. Simply press **<Shift>-<F1>DEH<Ctrl>-A<F7>**. The square will appear on screen, but it will not print.

You can also use a different character as a marker. Instead of pressing <Ctrl>-A in the sequence above, hold down **<Alt>** while you type an ASCII code on your computer's numeric keypad. For example, **<Alt>-20** produces a standard typographer's paragraph marker. You can use any character you want, but avoid normal alphanumeric characters to prevent confusion. You'll find a complete list of ASCII codes in Appendix A of your *WordPerfect* manual. —*Edward L. Mills, Quincy, Illinois*

Universal Word Processing Tips

You say you don't use any of the word processors we've covered in our 75 tips? Well, don't turn the page just yet. Here are five general tips you can use regardless of the word cruncher you employ.

16. Protect Your Templates

Any word processor worth its salt comes with prefab templates for creating memos, letters, or virtually any other common document. With built-in page layout, graphics, and text specs, a template can save you hours of design time. The problem is that it's all too easy to use a template, fill it with your own text and graphics, and save it under its original name—thus overwriting all your basic layout information.

The solution is simple: Make the template files read only. You'll still be able to load it and fill it with data, but when you go to save the file the word processor will prompt you for a new file name. The trick is to use DOS's ATTRIB command. First, make sure the directory where ATTRIB.EXE is stored (usually C:\DOS) is in your PATH. Then at the DOS prompt, issue ATTRIB +R [File Specification], followed by a space and the path and name of the template file. From here on, your template files will be free from unwanted intrusions.

17. Quick Text Selection in Windows

Generally, there's no faster way to select a block of text than by using the mouse. Here's a trick that works in any *Windows* word processor (as well as *Word 5.5* for DOS): Click the left mouse button at the start of the desired block, hold down <Shift>, and click the left button again anywhere else in the document. This will highlight all text between the first and second clicks, and you can do it moving up or down the file. To extend the highlighted area further beyond the second click, hold down <Shift> and click again.

18. Use Keyboard Shortcuts

Keyboards are for more than just typing. Even if you like to use the mouse for moving text around, the fastest way to get work done is usually by keyboard shortcuts. So take another look at your program's shortcut commands, or dust off that keyboard template—you'll find it faster than mousing around in menus.

19. Maximize Your Mail Merge

Most word processors let you break down mail-merge data in ways that make this useful feature even more powerful. For example, splitting a name field down into First Name, Middle Initial, and Last Name fields lets you personalize your mailings by creating Ms. *LastName* or Dear *FirstName* entries. Similarly, breaking a City, State, ZIP field down into separate fields lets you send documents only to clients in a particular state or ZIP code, or sort the records properly for bulk mail savings.

20. When in Doubt, Dial Up

When you can't seem to find an answer in the program's manual and technical support lines are busy, there's one resource you can almost always rely on: on-line forums. Services like America Online, CompuServe, and GEnie are a terrific resource for valuable tips, top-notch technical support, and a multitude of macros and utilities for your favorite applications. Here's a breakdown on the major on-line services, with the keywords you'll need to direct you to the proper forums:

America Online

General Help	PCWORLD (Word Processing)
Microsoft Word	MICROSOFT
WordPerfect	WORDPERFECT
JustWrite	SYMANTEC

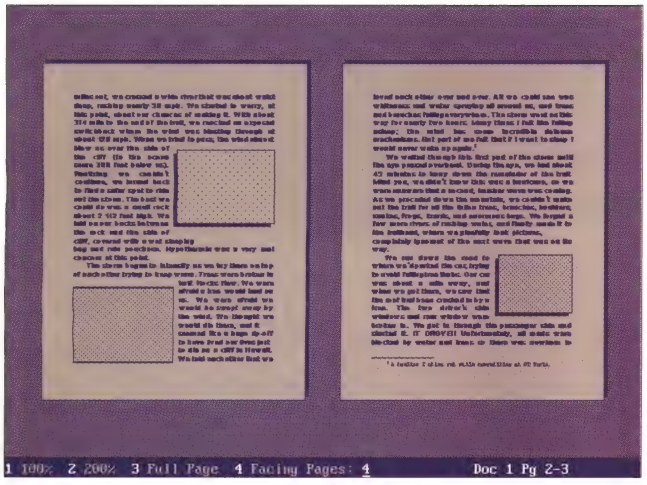
CompuServe

Ami Pro	LOTUS
JustWrite	SYMFORUM
Legacy	WINAPB
Microsoft Word	MSWORD
Professional Write	SPCFORUM
WordPerfect	WPUSER
WordStar	WORDSTAR

GEnie

Microsoft Word	MICROSOFT
WordPerfect	WP

—*G. C.*



ADDING DROP SHADOWS to WordPerfect boxes is an easy way to make charts and tables stand out. The key is using the Graphics (<Alt>-<F9>) menu.

21. Shadow Boxing With Graphics

WordPerfect 5.1 not only lets you create boxes for all the figures, text, and tables in your documents, it also lets you define shadowed borders for each box—an easy way to make items stand out. You can even create shadows for all boxes of the same type in one shot. To try this out, start with a document that already contains boxes, and press **<Home><Home><Home><Up>** to move the cursor to the top of the file. Now, press **<Alt>-<F9>**, type the number or letter of the type of box you want shadowed, then press **OB**. Choose a border type for each side of the box by selecting from the menu options at the bottom of the screen. Use your cursor keys to move to each side in turn. Select *Thick* or *Extra Thick* for two adjacent sides, and *Single* for the other two. Press **<F7>** to return to your document. The thick lines are offset for a dropped shadow effect. To view your work, press **<Shift>-<F7>V**. —*Robin Noe, Oak Ridge, Tennessee*

22. Printing WordPerfect File Lists

Need to find a file fast? Instead of scrolling through *WordPerfect*'s file list one screenful at a time, you may find it faster to print out a list of all your files at once. Here's how: Press **<F5>** to get to the file list, then press **<Shift>-<F7>**. You'll get a printed list, formatted as it is on the screen but including all files in the directory, not just a screen's worth. —*G. C.*

23. More Formatting Shortcuts

If you work frequently with *WordPerfect*'s Reveal Codes window (**<Alt>-<F3>**) and need to edit specifications for margins, headers, graphics boxes, and other codes, you'll appreciate a tool in version *5.1*'s SHORTCUT keyboard layout. To get to it, though, you'll need to install the alternative keyboard template, as described in the next tip.

Once you've installed SHORTCUT, press **<Alt>-<F3>** to open the Reveal Codes window. Use the cursor keys to select any formatting code. Then, to edit that code, press **<Alt>-E**. You'll see the menu associated with that code instantly, and can make any changes you like. This tip saves a lot of time, particularly when editing complex codes set in long menus, such as column setups or graphics box layouts. —*WordPerfect Corp.*

24. Keyboard Alternatives

When you installed *WordPerfect*, you also got several customized keyboard templates installed in your main *WordPerfect* directory. Each one remaps your keyboard, offering shortcuts that can speed up various word processing chores.

Here's a list of the supplied templates and their functions (for a complete list of keystroke assignments for these keyboard layouts, see Appendix H in your *WordPerfect 5.1* manual):

TEMPLATE	FUNCTION
ALTERNAT	Reassigns Help and Cancel keys
ENHANCED	Adds commands for 101-key keyboards
EQUATION	Keyboard shortcuts for the equation editor
MACROS	Keystrokes for 16 *WordPerfect*-supplied macros
SHORTCUT	Formatting shortcut keystrokes

To choose one of these templates as the default, press **<Shift>-<F1>K** to display the list, select a template using the mouse or cursor keys, then press **<Enter>** twice to return to the editing screen. The template you select becomes the default whenever you start *WordPerfect*.

When you want to switch back to your original keyboard template—say, to run one of your own keystroke macros—just press **<Ctrl>-6**. (However, your alternate keyboard will remain the default until you choose another using the <Shift>-<F1>K command.) —*G. C.*

25. Expand Your Editing Horizons

If you're settling for *WordPerfect*'s basic 25-by-80-line text screen, you may be limiting your horizons unnecessarily. Users of Hercules, EGA, VGA, and higher-resolution video boards can display up to 50 lines of text on a single screen. In addition, some display boards even come with specific video drivers for *WordPerfect* that increase the maximum number of characters in a line. While the characters will be smaller and the lines a little cozier, everything will still be readable.

Press **<Shift>-<F1>DT**, pick your display adapter type and press **<Enter>**. Select the screen resolution you want, then press **<Enter><F7><F7>**. The new setting you've selected becomes the default automatically. If you don't like what you see, you can return to your basic resolution by pressing **<Shift>-<F1>DTA<F7>**. —*G. C.*

26. Shrink Your Files

If you use graphics in *WordPerfect* documents, odds are you're wasting valuable disk space. The default settings in the program cause *WordPerfect* to save a copy of the graphic inside the document file. If you reuse the same image in several documents, the program creates separate copies of the graphic for each, eating up precious hard disk real estate. But there's a quick fix.

To create a figure box for a graphic, press **<Alt>-<F9>FC**, type in a file name, then set the positioning and other options. If you want to conserve disk space, press **O** while the menu is displayed, **D** to select the *Graphic on Disk* option, then hit **<F7>** to return to the document. *WordPerfect* will then store a pointer to the graphic file, not the file itself, inside your document.

Of course, if you delete the graphic file, move it to another directory, or send the file to someone else, *WordPerfect* won't be able to find it if you use this method. If that situation is likely to occur, it's best to use the default *Graphic* option in the menu, which stores the graphical data itself in the document file. —*G. C.*

WordPerfect 5.1 for Windows

27. A Familiar Feel for Windows

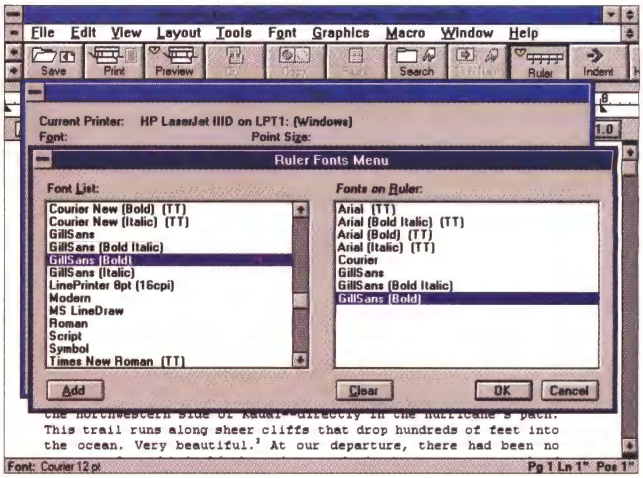
Making the jump from the DOS version of *WordPerfect* to the *Windows* version isn't as easy as you might think. For one thing, all the keyboard shortcuts that you have come to know have been changed. Press <F5> in the DOS version and you get the file list; press <F5> in the *Windows* version and you get the printing dialog box. Fortunately, you *can* go home to your familiar DOS keystrokes, but only if you have the interim upgrade dated April 30, 1992. (If you don't have this update, contact WordPerfect Corporation.)

Select *File•Preferences•Keyboard•Select,* highlight WPDOS51.WWK in the Files list, then choose *Select* and *OK*. You'll get most of your old keystrokes back, along with familiar keyboard shortcuts displayed inside your pull-down menus. You can then choose between the *Windows* or DOS keystrokes for most of your formatting commands. —*G. C.*

28. Adding Special Characters

Unlike the DOS version, *WordPerfect 5.1 for Windows* doesn't let you use the handy <Ctrl>-V or <Ctrl>-2 Compose command to insert special characters. To use this function in *Windows,* move the cursor where you want to insert the character, then select *Font•WP Characters* or press **<Ctrl>-W**. A window will pop up, showing a chart of the characters. Scroll down the list of character sets until you find the one you want. To insert a character into your document, you can double-click the character itself or select it and click *Insert*. You can then choose additional characters to insert. If you want to add just one character and return to your editing, select *Insert and Close*.

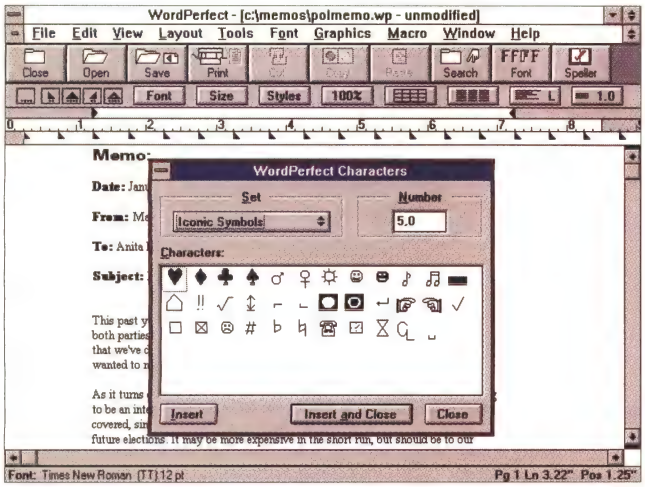
All these special *WordPerfect* characters will print using either *WordPerfect* or *Windows* printer drivers. If the special character isn't available in the current font, however, *WordPerfect* will print it as a graphic; it may look slightly different from the font used for the rest of the text. —*G. C.*



WORDPERFECT FOR WINDOWS lets you choose which typefaces to assign to its ruler button, for quick access to your workhorse fonts.

29. Customize Your Font List

Many *Windows* word processors give you a fast-access font button, but only *WordPerfect for Windows* lets you customize the button's font list to show only those fonts you use every day. Here's how to do it. Start by double-clicking the *Font* button on the ruler. In the next dialog box, select *Assign to Ruler.* In the Ruler Fonts Menu box, highlight each font you want to add to your font menu, then double-click on it or select *Add.* If you make a mistake, highlight the offending font in the Fonts on Ruler list, then select *Clear.* When you're done adding the fonts you want, select *OK* twice. Now, whenever you click the ruler's *Font* button, you can drag down to the font you want and simply release the mouse button. —*G. C.*



CHOOSING SPECIAL CHARACTERS in WordPerfect for Windows is a snap—just use the Font•WP Characters command.

30. Eyeing the Bottom Line

Unlike some programs, *WordPerfect for Windows'* mouse pointer does not change shape when it passes over picture boxes, lines, and other objects. Instead, you need to keep an eye on the status line at the bottom of the editing screen.

A good example of this occurs when you've drawn a horizontal or vertical line in your document with the *Graphics•Line* command. It's tough to tell just when the pointer is in the right position to operate on the line. But look at the status line, and you'll be able to see when you're directly over the line. A left click will then select the line, while a right click pops up the appropriate menu. —*G. C.*

31. Double-Click Button Bars

You may not know it, but *WordPerfect for Windows'* button bar has a dual personality. Click once on the Font button, and you'll get your customized list of fonts. Click twice, and you'll get the complete font selection dialog box with all the fonts on your system—considerably easier and faster than slogging through a series of pull-down menus. Double clicking on the Size, Tab Set, Table, Styles, and other buttons also puts you quickly inside the appropriate dialog boxes. —*G. C.*

32. Wholly Macros

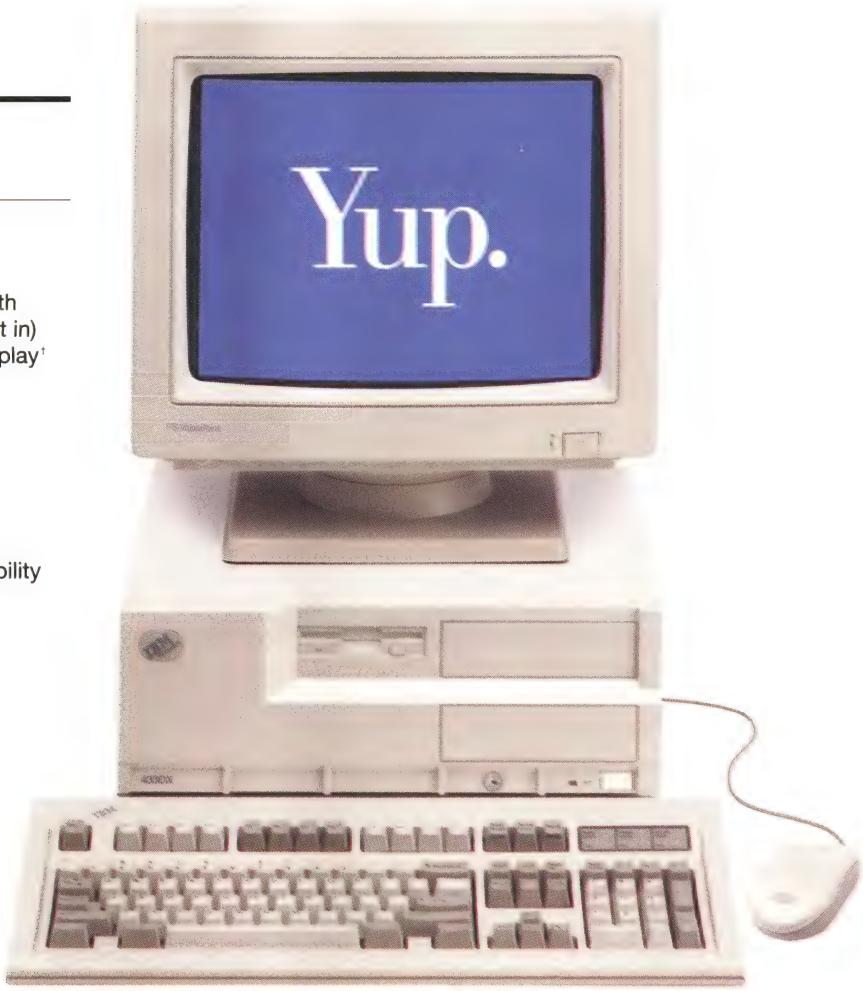
Need a handy tool in *WordPerfect for Windows?* Don't waste your time trying to reinvent the wheel. When you installed the program, *WordPerfect for Windows* installed a number of powerful, undocumented macros that can speed up your work. Here's a list of the more useful ones (the exact macros you have depend on the release date of your copy):

"You mean I can order from IBM over the phone?"

PS/ValuePoint™
433DX

i486™DX/33 MHz
120MB hard drive
8MB RAM
Pre-installed OS/2® 2.0 (with DOS and Windows™ built in)
6312 SVGA NI 14" color display[1]
3.5" diskette drive
IBM mouse
Internal i487™ math coprocessor
128KB L2 cache
8KB internal cache
1MB Video DRAM
Industry standard compatibility
Networkable
5 slots/5 bays

$1,999*



Welcome to IBM Direct.

PS/ValuePoint **466**DX2

i486DX2/66 MHz
212MB hard drive
8MB RAM
Pre-installed OS/2 2.0 (with DOS and Windows built in)
6319 SVGA NI 15" color display†
3.5" diskette drive
IBM mouse
Internal i487 math coprocessor
128KB L2 cache
8KB internal cache
1MB Video DRAM
Industry standard compatibility
Networkable
5 slots/5 bays

$3,119*

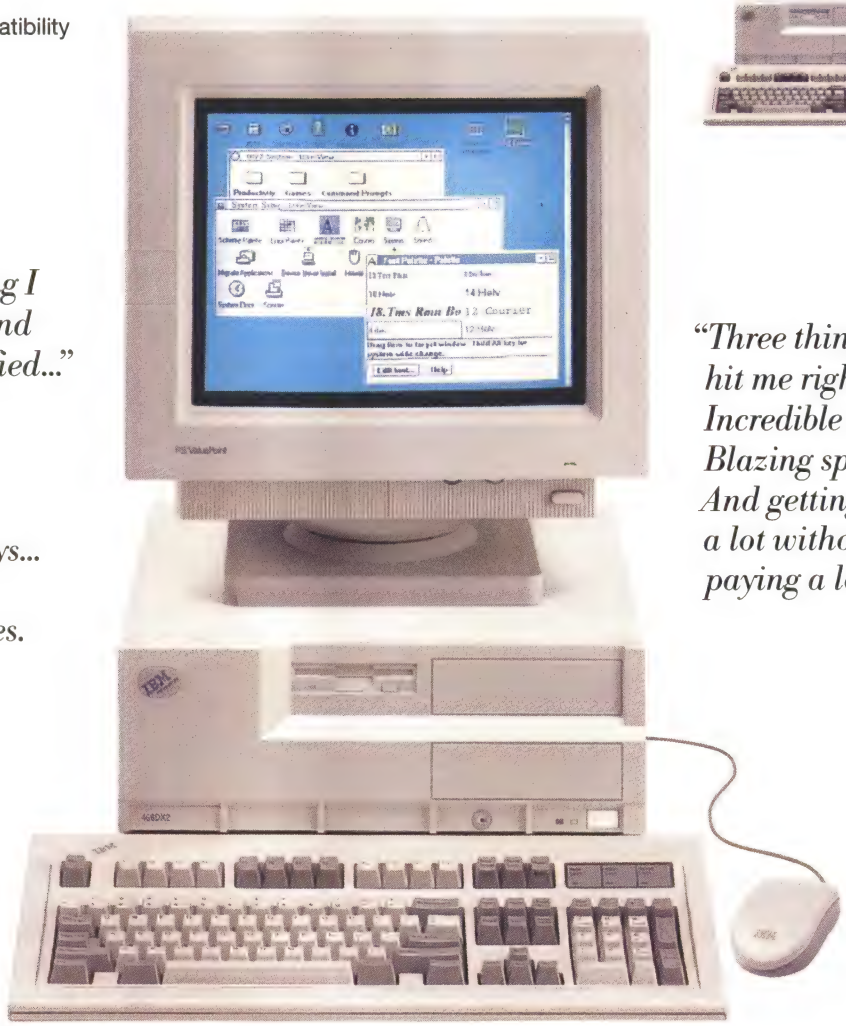
PS/ValuePoint **325**T

386SLC™/25 MHz
80MB hard drive
2MB RAM
Pre-installed DOS 5.0
PS/2® 8511 VGA color display
3.5" diskette drive
IBM mouse
5 slots/5 bays
IBM enhanced keyboard
Industry standard compatibility

$1,299*

"It's everything I need now...and Novell®-certified..."

"It's not just slots and bays... It gives me lots of choices. And that feels great."



"Three things hit me right off. Incredible power. Blazing speed. And getting a lot without paying a lot."

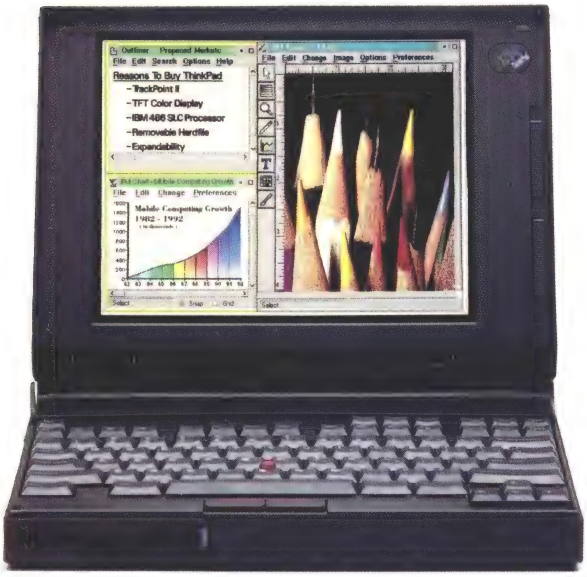
Every detail says IBM,

ThinkPad™ 700C†

486SLC/25 MHz
120MB hard drive
4MB RAM
DOS 5.0 and PRODIGY®†† pre-installed
10.4" active matrix color display
3.5" diskette drive
TrackPoint II,™ an integrated pointing device
Full-size keyboard, 84 keys
NiMH rechargeable battery pack
Removable hard disks
Slip-in IC DRAM cards for memory
Up to 16MB memory, system maximum

$4,139*

"No more mice scurrying around...This TrackPoint II is one hot little button."



"Wow! It's the biggest color screen I've ever seen."

intel inside™

ThinkPad 300†

386SL/25 MHz
80MB hard drive
4MB RAM
DOS 5.0 pre-installed
Integrated STN LCD display
3.5" diskette drive

$2,335*

IBM Direct

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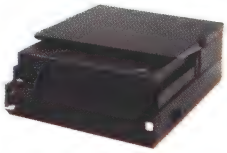

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MACRO	DESCRIPTION
CAPITAL.WCM	Capitalizes first letter of current word
ENDFOOT.WCM	Converts endnotes to footnotes
FOOTEND.WCM	Converts footnotes to endnotes
ENVELOPE.WCM	Addresses envelope
LABELS.WCM	Adds predefined label formats to printer page sizes
RECALC.WCM	Automatically recalculates all formulas in a table

To have a look at these and other included macros, select *Macro•Play•View*. Select one of the macros on the list, then read the description comments in the View window.

To run the macro, select *Play*. The first time you run any macro, *WordPerfect* compiles it, so it'll run rather slowly. From then on, you get it at full speed. —*G. C.*

33. Customize Your Defaults

Open a *WordPerfect for Windows* document, and the program defaults to 12-point Courier font and 1-inch margins. But why be dull? You can customize *WordPerfect*'s default fonts, margins, and virtually any of its other settings in flash. Just select *File• Preferences•Initial Codes*. The program gives you a blank document where you can set defaults, and displays the formatting codes you choose in a window. To change fonts, select *Font•Font*, choose the font name and size you prefer, along with any other formatting such as bold or italic, then select *OK*. To set new margins, select *Layout•Margins* and enter new measurements. When you're finished making changes, select *Close* to return to the editing screen. From now on, your new settings will be the default. —*G. C.*

34. Turning the Tables

If you're using the April 30, 1992, interim release of *WordPerfect for Windows 5.1* (or version 5.2), you've got some new tools you may not be aware of—like the ability to duplicate all or part of an existing table inside the same document. With the new drag-and-drop features, it's easy.

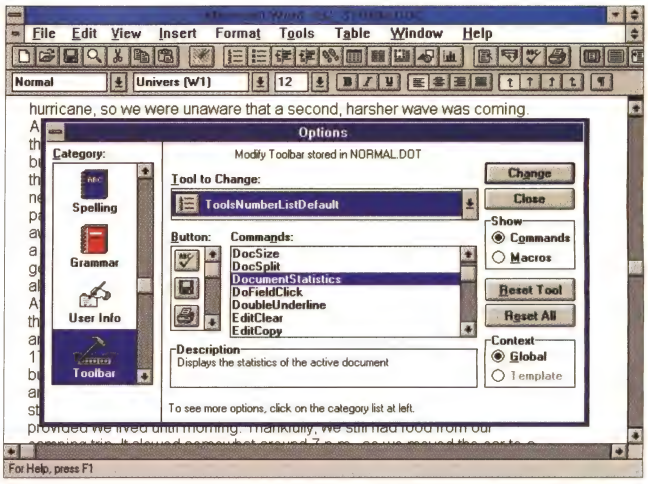
Choose a document that already contains a table. Move the cursor inside the table, hold down the left mouse button and the **<Ctrl>** key, and drag the mouse to select the cells you want duplicated. You can choose a single cell, a block, or the complete table. Release the mouse button and **<Ctrl>** key, and position the mouse pointer anywhere inside the area you just selected. Hold down the left button again, drag the pointer to the location where you want to paste the table, and release the button. —*G. C.*

35. Short-Order Menus

If you're like most users, you employ only a fraction of *WordPerfect for Windows'* wealth of features. But whenever you drop down a menu, you see what you don't use. Here's a trick that lets you switch back and forth between *WordPerfect for Windows'* full and short menus in the same work session.

First, make sure *WordPerfect for Windows* isn't running. Fire up *Windows'* Notepad or your favorite text editor and load WPWP.INI, which you'll find in your main *Windows* directory. Scroll to the section marked [Settings] in the file and add the line **EnableShortMenus=1** immediately following the [Settings] line. You'll see another line in this section that reads, ShortMenus=0. If you'd like the program to start up with abbreviated menus, change the line to read **ShortMenus=1**. After you've made these changes, save the file and exit Notepad.

Now, start *WordPerfect for Windows* and select *View*. In the menu that drops down, you'll see a new entry, *Short Menus*. Select this command to add or remove the checkmark beside it. If it's checked, you'll see just the basic menus. If it's unchecked, you'll see the expanded, full menus. You can toggle back and forth between the options at will. —*G. C.*



PUSH-BUTTON WORD PROCESSING: You can customize WinWord's toolbar, assigning buttons to your own macros or favorite commands.

Microsoft Word for Windows 2.0

36. Custom Toolbars

Why waste time hunting for macros in the Tools•Macro menu when you can call them with a click of a button? *WinWord* makes it fairly easy to decide which tools and commands you want to display as icons on its customizable button bar. (Select *View•Toolbar* if the toolbar isn't visible just below the menu bar.)

First, select *Tools•Options*, press **T** to get to the Toolbar Options dialog box, and select *Macros* in the Show box. Scroll down the Macros list until you highlight the one you want to turn into a button, then scroll the list of buttons to select one you want to assign to the macro. The Tool to Change list displays the names of all the buttons currently on the toolbar, as well as the empty spaces between them. Scroll down the list and select the button or space you want to replace, select *Change*, and then *Close*. Your new macro button appears instantly in your toolbar. Click once on the button to let it work its magic.

You can perform the same trick with commands, adding and deleting them from the toolbar at will. Simply select *Commands* in the Show box and follow the procedures outlined above. When you exit *WinWord*, be sure to select *Yes* when prompted to save global changes. —*Christina Wood*

37. Jump-Starting WinWord

If you do the same thing each time you start *Word for Windows*—say, choose the Find File or Open command from the File menu—you can save time by having *WinWord* execute that first command for you. Just select your *WinWord* icon in Program Manager and press **<Alt>-<Enter>** to open the Properties dialog box. Position the cursor in the Command Line box after WINWORD.EXE, type a space, and type **/m** followed by the startup command you want, for example, **/mFileOpen** or **/mFileFind**. (You can use this /m switch with any WordBasic com-

mand or macro name.) Then click *OK*. The next time you double-click the *Word for Windows* icon, it will start *WinWord* with the Open or Find File dialog box ready for you to use. But make sure that the Command Line box includes the full path to your *WinWord* directory, otherwise the tip may not work. —*R. J. L.*

38. Custom Menus

While toolbars may vary from template to template, menus are forever. You can add an indispensible macro to one of *WinWord*'s pull-down menus and access it quickly no matter what template you're using at the time. Here's how:

Select *Tools•Options*, press **M** to call up the Menus Options dialog box, and select *Macros* in the Show box. Then select the name of the macro you want to add and the menu you want to add it to. Select *Add*, then *Close*. Remember: You need to accept all global changes at exit time, or you'll have to do this procedure all over again. —*G. C.*

39. Drag Till You Drop

As just about everybody knows, *Word for Windows 2.0* lets you select text with the mouse, then drag it to a new location in your document. But did you know that the same technique works for virtually every item in a document, including tables, pictures, charts, and inserted OLE objects? For most objects, the steps are the same as with text: Place the cursor inside the object, hold down the left mouse button to select it, drag it to a new locale, and release the button. With tables, it's a touch trickier: You'll have to click and drag to select the entire table, then release the mouse button. Move the pointer back into the selected area, hold down the left button, then drag and release as usual.

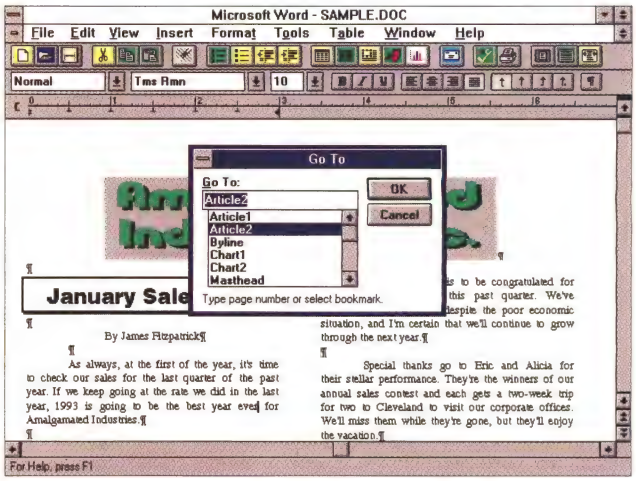
Want to copy the item to a new location instead of moving it? Simply hold down the **<Ctrl>** key before and while you release the mouse button. —*C. G.*

40. Fast Global Font Changes

You can change the font of an entire *WinWord* document with just a few keystrokes. First, press **<Ctrl>-5** (using the numeric keypad) to highlight the entire document, then hit **<Ctrl>-F** and press **<Down>** (or the first letter of the desired font's name) to scroll through the list of fonts. Once you've selected a typeface, you can change its size by pressing **<Tab>** and typing a new point size. When you're done, just press **<Enter>** and return to your editing. —*Daniel Tynan*

41. WinWord Marks the Spot

If you often work on long documents, you should be using *WinWord*'s Bookmark feature. By inserting named bookmarks, you'll make it easier to jump to any section, chart, graphic, or other location you'll need to find quickly when editing.



WINWORD'S BOOKMARKS let you jump instantly to any location in a file—a priceless tool for long documents.

To insert a bookmark, place the cursor where you want the mark to be, then select *Insert•Bookmark* to get the Bookmark dialog box (or press **<Ctrl>-<Shift>-<F5>** for a simple prompt on the status bar at the bottom of the screen). Type a brief name for the bookmark, then select *OK* (or press **<Enter>**). Remember, though, if you select a block of text or an object before inserting the bookmark, that text or object will be highlighted again when you jump to that bookmark. If you delete or move the highlighted items, the bookmark is similarly affected.

Now, any time you need to return to that point in your document, select *Edit•Go To* (or hit **<F5>**), pick your bookmark from the list (or type the bookmark's name), and select *OK* (or hit **<Enter>**). —*G. C.*

42. Need it Again? Spike It.

If you need to store one or more blocks of text or objects such as graphics, tables, or charts in *Word for Windows*, use the Spike feature, which stores the data temporarily for insertion later. Simply select the text or object, then press **<Ctrl>-<F3>**. This cuts the data from the document and loads it into the Spike buffer. Unlike *Windows'* Clipboard, you won't lose your previous cuts when you add new ones—you can repeat the process to store multiple objects in the Spike buffer. It's a great way to gather up bits and pieces, then insert them elsewhere.

To copy contents of the Spike into your document, locate the cursor where you want the item, then type **spike** and press **<F3>**. You can repeat this command as many times as you like to paste the same data. If you want to insert the Spike's contents just once, clearing it from the buffer at the same time, press **<Ctrl>-<Shift>-<F3>** instead.

Best of all, you can store data from one *WinWord* document in the Spike buffer and reinsert it in another *WinWord* document window you have open. Exiting *WinWord* flushes the contents of the Spike. —*G. C.*

43. Counting Blocks

While *WinWord* gives you fast word and character counts for a whole document, it won't let you measure individual sections of the file—a nice tool to have when you're trying to make different parts of a long file the same length. Fortunately, we've cooked up a macro that does the job for you.

First, you'll need to fire up the WordBasic macro editor: In *WinWord*, select *Tools•Macro*, type **CountSelect**, then select *Edit*. In the macro editor, carefully type the lines in the listing below between the Sub MAIN and End Sub entries.

```
EditCopy
FileNew .NewTemplate = 0, .Template = "NORMAL"
EditPaste
Dim dlg as DocumentStatistics
GetCurValues dlg
Dialog dlg
Super DocumentStatistics dlg
Super EditUndo
FileClose
```

Finish up and save your macro by selecting *File•Save All,* and then select *Yes* in all the dialog boxes that pop up. Exit the macro editor by selecting *File•Close.*

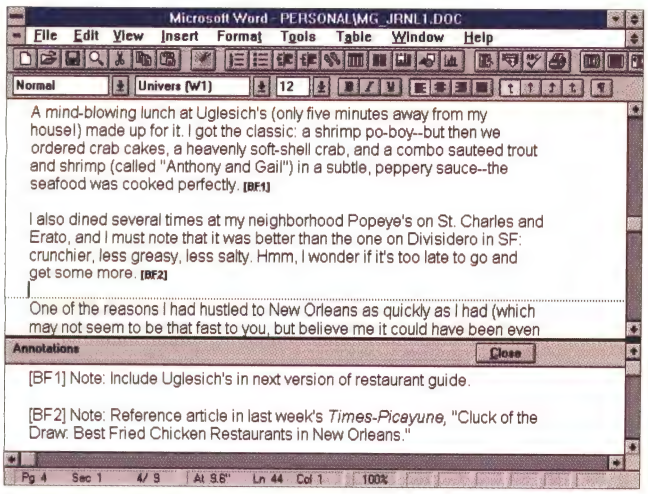
To use the macro, select the block of text you want to measure, then select *Tools•Macro.* Choose the *CountSelect* macro, then select *Run;* or double-click *Count Select.* You'll see the statistics for just the selected block. Select *OK* to return to the document. If you find you use this macro frequently, you can assign it to a keystroke combination or to an icon on *WinWord*'s toolbar. —*John Walkenbach*

44. Notes to Yourself

Word for Windows has the equivalent of Post-it notes, and they're easy to use. Whenever you need to leave yourself or another user a note in a document, select *Insert•Annotation,* type your note in the window at the bottom of the screen, then select *Close.* There's just one problem—*WinWord*'s default settings don't let you see the marker for the note because it's formatted as hidden text.

To view the markers in your document, and make that option the default, select *Tools•Options,* press **V** to get to the View settings, then check the Hidden Text box and select *OK.* For each note in the document, you'll see an identifying marker that consists of your initials and a number inside square brackets. Repeat the operation to uncheck the box when you want to hide the note markers.

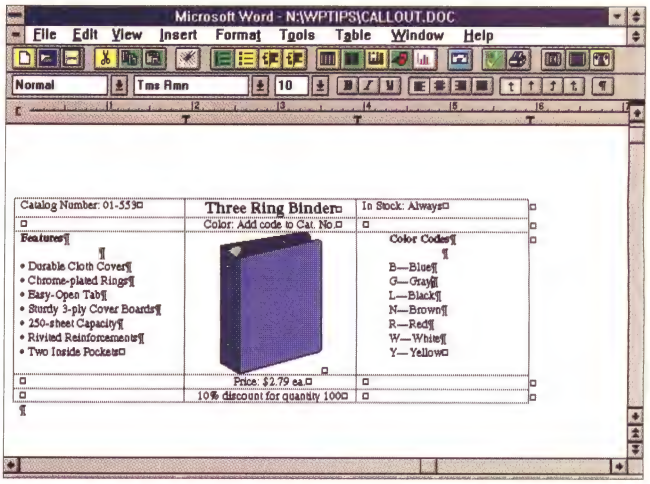
To view the note, double-click the marker, then select *Close* when you're through. To remove a note permanently, simply select the marker with your mouse or keyboard and press **<Delete>**. —*G. C.*



WINWORD USERS TAKE NOTE: You can annotate documents and view your notes with a mouse click—just turn on the Hidden Text view.

45. Word and Pictures

Do you need to insert a picture in a *Word for Windows 2.0* document, then position descriptive text nearby? An easy way to do this is to create a table and insert the graphic into a cell, then add the text into neighboring cells. To create a table, select *Table•Insert Table.* For best results, you should specify an odd number of rows and columns, so you can locate the picture in the center of the grid, and size the cell as desired. Move the cursor into one of the cells, select *Insert•Picture,* select a graphic, then select *OK.* The picture will appear in the cell. To center the picture inside the cell, highlight it and click the centering icon on the ribbon (select *View•Ribbon* if the ribbon isn't visible). Now you can use the other cells of the table for your text. This is a great technique for creating product descriptions in catalogs and flyers. —*G. C.*



SURROUNDING WINWORD PICTURES with descriptive text or captions is a lot easier when you use a table to hold both picture and text.

46. No More Disappearing Text

As in most *Windows* programs, when you select a block of text in *Word for Windows,* anything you type replaces that text. This can be especially annoying when you search for a text string: The text string remains selected, then the next key you press overwrites it. Although you can get the text back with a quick Edit•Undo command, you might want to disable this overwrite feature. Making the change is easy. Select *Tools•Options,* press **G**, then uncheck the Typing Replaces Selection box. Select *OK* to finish the job and make your choice the new *Word for Windows* default. From then on, if you type while text is selected, your new text will appear to the left of the selected text, just as it does in *Word 5.0.* —*G. C.*

47. WinWord's Go-Back Key

If you've selected text or an object in a *Word for Windows* document, then used the scroll bars to look at something else at another location in the document, *WinWord* offers a quick way to get back to where you were. Just press **<Shift>-<F5>**.

But there's more to this magic keystroke. If you press **<Shift>-<F5>** immediately after loading a document, the cursor will return to exactly where it was when you saved the file. *WinWord* stores the last three cursor positions as you work on a document. Repeated presses of **<Shift>-<F5>** take you back one step at a time. —*G. C.*

48. Using Special Characters

Everyone needs to use a special character now and then, whether it's a foreign currency mark or a star from a dingbat font. To access special characters from *Word for Windows,* select *Insert•Symbol.* Scroll down the list of symbol sets until you find the one that contains the character you want, then look at the character grid. To insert the character, double-click on it with the mouse or use the cursor keys to select it and hit **<Enter>**. (If you have the Field Codes box checked in the *Tools•Options•View* dialog box, you'll see the symbol's field marker. Uncheck the box to see the symbol itself.) Once the character is

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in the document, you can alter its size as you would any other character. —*G. C.*

49. Instant E-Mail Formatting

Creating properly formatted ASCII files for uploading to electronic mail systems or services like MCI Mail can be a chore. Unless you're extremely meticulous, you're likely to get funky line breaks all over the place. Here's a macro that does the job in a flash.

To create it, you'll have to crank up *WinWord*'s WordBasic macro editor: Select *Tools•Macro*, name the macro **FormatEmail**, then select *Edit*. In the macro editor, carefully type the lines shown in the listing below between Sub MAIN and End Sub.

```
EditSelectAll
Prompt$ = "Enter a file name for your Email text file:"
Title$ = "Email File Name"
Default$ = ""
MyFile$ = InputBox$(Prompt$, Title$, Default$)
If MyFile$ = "" Then Goto Quit
Font "Courier", 12
FileSaveAs .Name = MyFile$, .Format = 3
NormalStyle
SendKeys "{left}"
Quit:
```

When you're done, check your typing, select *File•Save All*, and select *Yes* at all the prompts that appear. Select *File•Close* to get back to your document.

To use the macro, start *WinWord* and type your E-mail message. When you're ready to save it, select *Tools•Macros•FormatEmail*. Enter a file name when prompted, complete with path information if necessary, then select *OK*. The macro will reformat your text as 12-point Courier, with hard carriage returns at the end of each 60-character line. It then saves the new file, with the file name you specified, in ASCII format with carriage returns at the ends of the formatted lines. You can then send that file as an E-mail message using your communications or E-mail package. Then your document will return to its original formatting, and you'll return to the top of the document. —*G. C.*

50. Smart Repeats

WinWord has an elephant's memory. In fact, *WinWord* will remember everything you've typed, including backspaces, since the last time you executed some other command. If you press **<F4>** (or select *Edit•Repeat Typing*), the program will insert all that text at the cursor position. You can type something once, then move the cursor and press **<F4>** to insert the same text. (To make sure there's no other text inside the buffer, issue any command, such as *Format•Character*, before typing the text.)

WinWord also remembers formatting commands, and can repeat them with **<F4>** (or *Edit•Repeat Formatting*). For example, if you need to reformat several words or paragraphs in different locations, highlight the first word and make the formatting changes using the Format menu. Then you can select other text and press **<F4>** to duplicate the effect.

Finally, if you're not sure of the status of the repeat key at any time, just pull down the *Edit* menu and take a look. The Repeat menu entry always remembers the last thing you did. —*G. C.*

51. Dating WinWord Docs

Having *WinWord* insert the current date automatically every time you open a document is a good way to track revisions, and it's easy to do. Select *Insert•Field*, then pick *Date* in the Insert Field Type list in the dialog box. Choose a format from the Instructions list (the *MMMM d, yyyy* option gives you a fully expanded date, as in January 25, 1993). Select *OK* to insert the date field at the cursor. You can add boldface or other text attributes to the date and set its alignment with normal commands. Each time you load the document, the current date will display. —*G. C.*

52. Calling All Fonts

Did you ever wonder what all your fonts look like on paper? If you have the *Word for Windows 2.0a* upgrade or a later one, you can find out.

When you installed *WinWord*, you also installed a document called PSS.DOC on your hard disk. Load it into your word processor. A number of self-installing macros are included in the document, including one called PrinterTest that creates a document containing samples of every font you have available, along with border and shading styles. Scroll down in the PSS.DOC file until you find PrintTest's description, double-click its *RUN* button, then select OK. (If you have the Field Codes box checked in the *Tools•Options•View* dialog, the RUN button won't work.) The macro will create the document, which you can then print out. If you have scores of fonts, the process can take several minutes. Take a look at the other macros in PSS.DOC as well—you're sure to find others you want to try. —*Microsoft Product Support*

53. Changes in Styles

Word for Windows includes a set of more than 20 preset styles for your text in its NORMAL.DOT template. These include nine heading styles, eight table of contents styles, plus footnote and annotation styles. But when you use the *Format•Style* dialog, you normally see only a partial list. While it's true that you may not need all these styles, wouldn't it be nice to see them and decide for yourself? Here's how.

Select *Format•Style*, then press **<Ctrl>-Y**. *WinWord* will add the hidden styles to the drop-down list, making them instantly available. You'll have to repeat this keystroke each time you use the dialog box and want to see the complete style list. —*Microsoft Product Support*

Microsoft Word for DOS

54. Fast File Loads

Everyone sometimes needs to exit a word processor completely to do some other work, then return to editing the same document. In any version of *Word* for DOS, it's easy. Just start *Word* with the command **WORD /L** at the DOS prompt. *Word* will automatically load the last document you worked on, with the cursor right where you left it. —*G. C.*

55. Making Word 5.5 More Familiar

If you've switched to *Word 5.5* but miss the function keys you're used to from earlier versions of *Word*, you don't have to learn an entirely new system. You can go back. Select *Utilities•Customize*, then check the Use Word 5.0 Function Keys option. If you're used to the way the <Insert> key worked in earlier versions, check the Use

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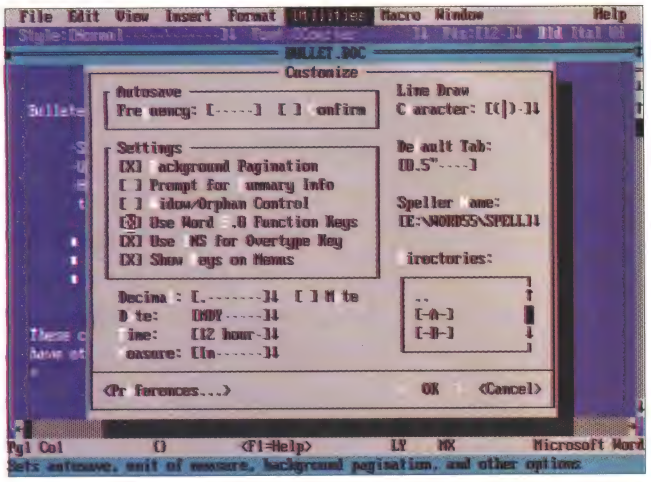


MOVING UP FROM WORD 5.0? Version 5.5 makes the transition easier by letting you choose 5.0's familiar function-key combos.

Ins for Overtype Key option as well. Select *OK* to finish up and store these settings as the defaults. —*G. C.*

56. One-Word Spelling Check

You don't always want to check the spelling of an entire document. In *Word 5.*x, you can easily check the spelling of just part of a document. Highlight the text to be checked, then give the check spelling command (**<Alt>-<F6>** in version 5.0 or **<F7>** in version 5.5). *Word* will check only the highlighted text, letting you get back to work more quickly. —*G. C.*

57. Instant Text Moves

If you need to move a block of text in *Word 5.*x, here's a trick for mouse users. Start by highlighting the text you want to move, using the mouse or *Word*'s keyboard shortcuts. Now, move the mouse pointer where you want the text to go, hold down the **<Ctrl>** key, and click the right mouse button. Your text, still highlighted, will move instantly to the new location. —*G. C.*

58. The Big Picture

If you'd like to see more of your document in *Word 5.0*, and you're using an EGA, VGA, or Hercules-compatible monochrome system, you can see up to 60 lines of text on your screen. The result may not be pretty, but you'll be able to see an entire page of text at once without scrolling. First, press **<Esc>O**, tab to the Display Mode field and press **<F1>**. You'll see a menu of the text and graphics options for your display type. Select the one you want and press **<Enter>** to make it the default.

You'll find the same options in version 5.5. Select *View•Preferences*, then choose a Display Mode from the list and select *OK*. Here's the best part: In both versions, *Word* remembers the previous display option as well. To switch back and forth between them, press **<Alt>-<F9>**. —*G. C.*

59. Quick Bordered Text

Need a border or lines around some text in *Word* for DOS? It's easy. Start by positioning your cursor inside the paragraph to be boxed. Then, in *Word 5.0*, press **<Esc>FB**. Select the options you want from the fields in the menu, then press **<Enter>** to create the box. In *Word 5.5* the process is slightly different: Select *Format•Borders*, make your selections in the dialog box, then select *OK* to finish the job. (If you want a single box around multiple paragraphs, press **<Shift>-<Enter>** instead of <Enter> between paragraphs.) —*G. C.*

SURROUNDING A BLOCK OF TEXT with a border is easy using Microsoft Word's Format Borders command.

60. Word's Glossary Memories

How many times have you typed your name and address into a letter or other document? Don't waste your time. With *Word 5.*x you can store those phrases, as well as entire blocks of frequently used text, as Glossary entries with all their formatting intact. Here's how.

In *Word 5.0*, start by typing and selecting a block of text you want to store. Now, press **<Esc>C**. Type in an abbreviation for the text—one you'll remember easily—such as **Myname** or **ReturnAddress**. Use any abbreviation you like, but without spaces or punctuation. Press **<Enter>** to store the abbreviation and text. Repeat this as often as you like, adding Glossary entries in any *Word* session. To save the entries, press **<Esc>TGS<Enter>**.

To store a glossary entry in *Word 5.5*, select the text, then select *Edit•Glossary*. Type in a glossary abbreviation or name, then select *Define*. To save your glossary entires, select *Edit•Glossary•Save*.

Now, whenever you need one of these entries in either *Word* version, just type the abbreviation and press **<F3>**. *Word* will insert the whole entry at the cursor position. If you can't remember the abbreviation for a glossary entry, press **<Esc>I<F1>** in version 5.0, or select *Edit•Glossary* in version 5.5, then pick the glossary entry you need from the list. —*G. C.*

61. Fast Moves With Bookmarks

If you work on long documents, don't neglect *Word 5.0*'s speedy bookmarks. By placing a bookmark at spots in your document you need to find frequently, you'll be able to speed up your editing dramatically. To insert a bookmark at the current cursor position or on selected text, press **<Esc>FK**, type an easy to remember name for the mark (no spaces), then press **<Enter>**. When you need to jump to that spot from anywhere in the document, press **<Esc>JK**, type the bookmark's name or press **<F1>** to pick it from a list, then press **<Enter>**. If you highlighted a block of text when you created the bookmark, that text will be selected after the jump. —*G. C.*

62. Back to the Beginning (or End)

When you've selected a large block of text in *Word 5.*x or earlier versions, the begin-

ning or end of the block may be off the screen. Once you perform formatting or another operation on the block, you'll want to get back to the start or end of the block quickly. It's easy. Press **<Left><Right** and you'll find yourself back where you started, with the previously selected text deselected. To move just past the end of the block, press **<Right>** instead. —*G. C.*

63. Fast Mouse Selections

Word 5.x offers a quick way for mouse users to select either whole lines or entire paragraphs of text. To make this work, position the mouse cursor in the blank area to the left of the text to be selected. To select a line of text, click the left button. A right click selects the entire paragraph. —*G. C.*

Ami Pro 2.0 and 3.0

64. What's My Icon?

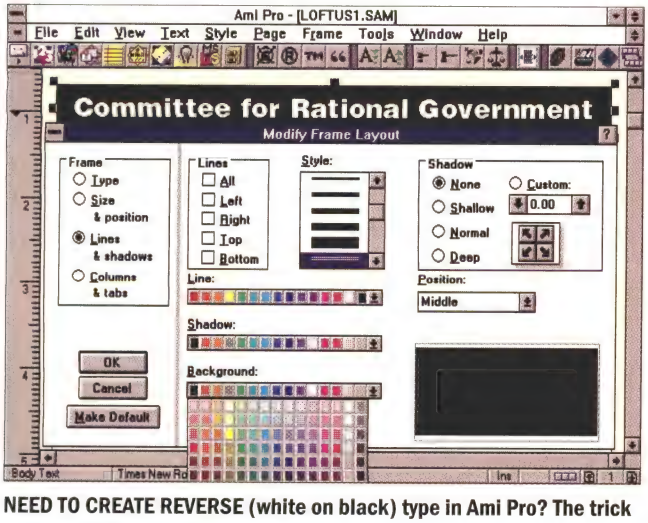
Ami Pro's SmartIcons icon bar can really speed up your work, but it can be tough to remember what a particular icon does. In versions 2.0 and 3.0, your right mouse button is the key to end the confusion. Just click and hold the right button on any icon to see a description of each tool in the Title Bar. —*G. C.*

65. Reverse Type

Using white text on a dark background (known as *reverse* type) is an easy way to make your documents stand out. While *Ami Pro* won't let you format normal text this way, you can still create this effect in version 2.0 or 3.0. Start by creating a frame for the text by selecting *Frame* and specifying the frame's size and position. Double-click in the frame, type your text, and then select it. Format the text using the *Text•Font* command, selecting the font and attributes you want, then click on the white square inside the Font dialog box's color selection bar, and press *OK*. The text will seem to have disappeared, but don't worry, it's still there.

Now select *Frame•Modify Frame Layout.* Inside the dialog box select *Lines & shadows* in the Frame area. Click on the black square on the Background color selection bar, then click *OK*. Voilà! You now have white text against a black background.

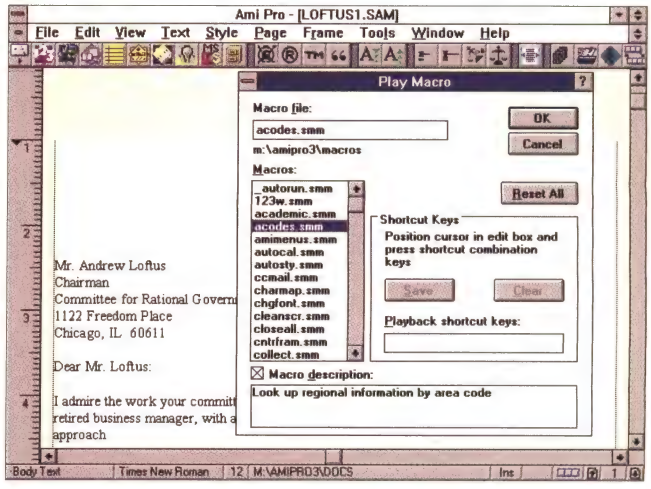
To choose another color for the background, display the expanded color selection chart by clicking the arrow in the Background section, then select the shade you want. Your text will appear and print as white letters on your selected background shade. But remember, reverse type is best used sparingly, for headlines, section titles, and other attention-getting text. —*G. C.*



NEED TO CREATE REVERSE (white on black) type in Ami Pro? The trick is to put it inside an object frame.

66. Ami Pro's Secret Macros

Ami Pro ships with a healthy collection of helpful macros, but you may not read about them in the manuals. To get the scoop about *Ami Pro*'s undocumented macros, you'll need to start *Ami Pro* and open GOODIES-.SAM, which you should find in your *Ami Pro* default document directory. Here you'll get an annotated list of some of *Ami Pro*'s more interesting macro-based features. While both version 2.0 and 3.0 sport a good-size set of fancy macros, *3.0*'s are especially hot, with new tools for modifying menus, batch printing and file conversion utilities, an area code finder—even a game that runs in the *Ami Pro* window. To help you add any or all of these macros to your *Ami Pro 3.0* menus, select *Tools•Macros•Playback,* pick SPECIALF.SMM, and select *OK*, then follow the instructions on the screen. Version 2.0 users will have to add their goodies to menus manually. Don't miss these valuable tools. —*G. C.*



GOOD SAMARITAN: AMI PRO comes with a bunch of undocumented macros. To read about them, open up Ami's GOODIES.SAM document.

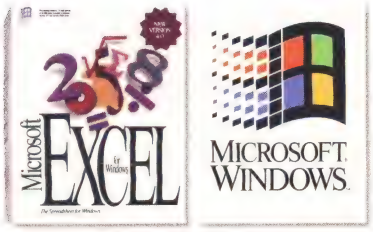
67. True Typographical Characters

You can't type typographically correct opening and closing double or single quotation marks, apostrophes, or dashes in *Ami Pro 2.0* or *3.0*—they're simply not on the keyboard. While you can hold down <Alt> and type the ANSI codes for these characters on the numeric keypad, *Ami Pro* offers a better solution in its SMARTYPE.SMM macro, installed with the program.

First, create your document the normal way, typing keyboard quotation and apostrophe characters. Where you want a dash, type two hyphens. Then, if you're using version 2.0, select *Tools•Macros•Playback,* select SMARTTYPE.SMM from the list of macros, then select *OK*. *Ami Pro* will go through the document, changing quotation marks, apostrophes, single quotation marks, and your double hyphens into the typographical equivalents.

It's even easier with version 3.0. Click on the SmartIcon selector icon at the bottom right of your screen, then choose the *Macro Goodies* option. The SmartType icon looks like an opening quotation mark and will run

We figured it would take a Wizard to make your job easier.



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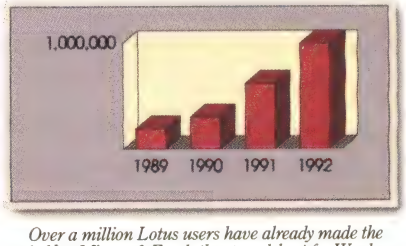

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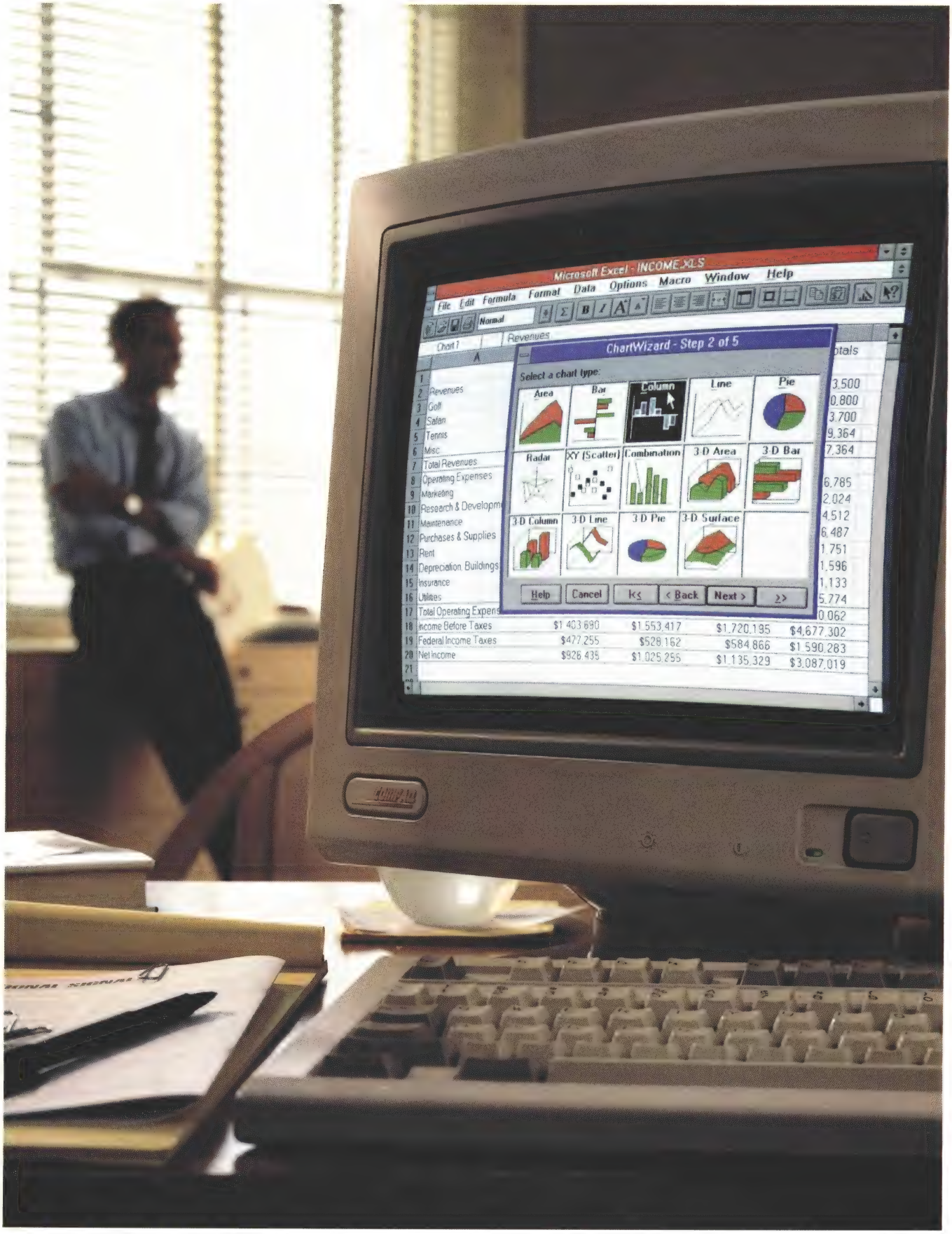

With Microsoft Excel, making a great-looking chart has never been easier. That's because the ChartWizard tool helps you create smart-looking charts, step-by-step.

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the macro automatically. Version 2.0 users can add this macro to their icon bar manually in the *Tools•SmartIcons•Customize* dialog box.—*Dan Shackelford, Fullerton, California*

68. Mix and Match SmartIcons

Ami Pro 3.0 ships with eight complete sets of SmartIcons. Each set is designed to complement different tasks, such as editing, proofing, and working with graphics. To switch between them, click on the SmartIcon icon on the right side of the status bar at the bottom of the *Ami Pro* screen, then pick the set you want to use. —*G. C.*

69. Smarter-Looking Icons

You don't like the look of an *Ami Pro 3.0* SmartIcon? Change it by selecting *Tools•SmartIcons*. Select *Edit Icon*, then in the next dialog, select the icon to edit and, choosing colors from the color bar, draw with your mouse to alter the icon. When you're done, select *OK* to finish the change.

If you use a VGA or super-VGA monitor, there's an easy way to display more SmartIcons on your *Ami Pro 3.0* screen: Make them smaller. To do this, select *Tools•SmartIcons*, select the *Icon Size* button, then select the *Small (EGA)* option and click *OK*. From then on, you'll see more of the SmartIcons at once, in a smaller size. —*G. C.*

70. Fast E-Mail Formatting

You can format documents for electronic mail using *Ami Pro 2.0* or *3.0*, but it takes a macro to do the job quickly. To create the macro, fire up *Ami Pro* and start with a blank screen. Then type the macro language code shown in the listing at right.

When you're finished, check your typing, then select *File•Save As*. In the file type list, choose *Ami Pro Macro*. Type **MAKEMAIL** in the Filename field, then select *OK* and close the macro file. (If this tip leaves your E-mail in Times New Roman or a font other than Courier and you use *Windows 3.1*, substitute "Courier New" for "Courier" in the macro.)

To use the macro, create your document as usual, then select *Tools•Macros•Playback*, pick MAKEMAIL.SMM from the list, then select *OK*. Type a path and file name for your E-mail file at the prompt, and select *OK* when you see the ASCII Options dialog box. You can then upload the newly saved ASCII file with your communications or E-mail program. The lines will be the correct length for any E-mail system. If you'll use this macro often, save time by assigning it a shortcut key or adding it to the SmartIcon bar. —*G. C.*

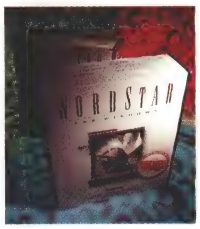
```
FUNCTION main()
Prompt$ = "Enter the path and file name for your Email file."
NoName$ = ""
MyFile$ = Query$(Prompt$, NoName$)
IF MyFile$ = ""
        GOTO Quit
ENDIF
TYPE ("[CtrlHome]")
TYPE ("[ShiftCtrlEnd]")
FontFaceChange ("Courier")
FontPointSizeChange (12)
ImportExport(1,MyFile$,"ASCII",0,"LINE",ASCII,0)
FontRevert()
TYPE ("[CtrlHome]")
Quit:
END FUNCTION
```

71. Selecting an Entire Document

Ami Pro versions 2.0 and 3.0 lack a command to select the entire document. You can work around this missing feature by pressing **<Ctrl>-<Home><Ctrl>-<Shift>-<End>**. If you use this command frequently, it's worth recording as a macro. —*G. C.*

72. Multiple Frames in Ami Pro

If you use *Ami Pro* to create product catalogs, design business cards, or even just print mailing labels, you'll need to create the same frames over and over on the page. But why design each new frame from scratch? With *Ami* you can create one and insert as many copies of it as you need. Use the *Frame* command to create a new frame, then fill it with your text. Click once on the frame to select it, then copy it to the Clipboard using a SmartIcon or *Edit•Copy*. (If you've nested other frames inside the frame to be moved, you'll need to hold down **<Shift>** and click on all the frames before copying them to the Clipboard.) Move the cursor to where you want to insert a copy of the frame and select *Edit•Paste* (or press **<Shift>-<Insert>**). You can then hold down **<Shift>** while you drag the frame to any location on the page. The original will stay just where it was. —*G. C.*



WordStar for DOS and Windows

73. Partial Spelling Checks in WordStar 6.0 and 7.0

WordStar normally runs its spelling check from the beginning of the document. Often, though, you want to check spelling only from the current cursor position. Select *Utilities•Spelling Other•Spell Rest* or use the classic command **<Ctrl>-QL**. —*G. C.*

74. Multiple Docs in WordStar for Windows

Unlike most *Windows* word processors, *Wordstar for Windows* won't let you open multiple documents simultaneously. However, you *can* run more than one copy of the program to edit additional documents. On a typical *Windows 3.1* system with 4MB of RAM, you should be able to run three copies simultaneously, depending on how large the documents are. You can still cut and paste between documents via the *Windows* Clipboard. If you try this trick, though, be sure to close all other applications and save your work frequently to avoid problems. —*G. C.*

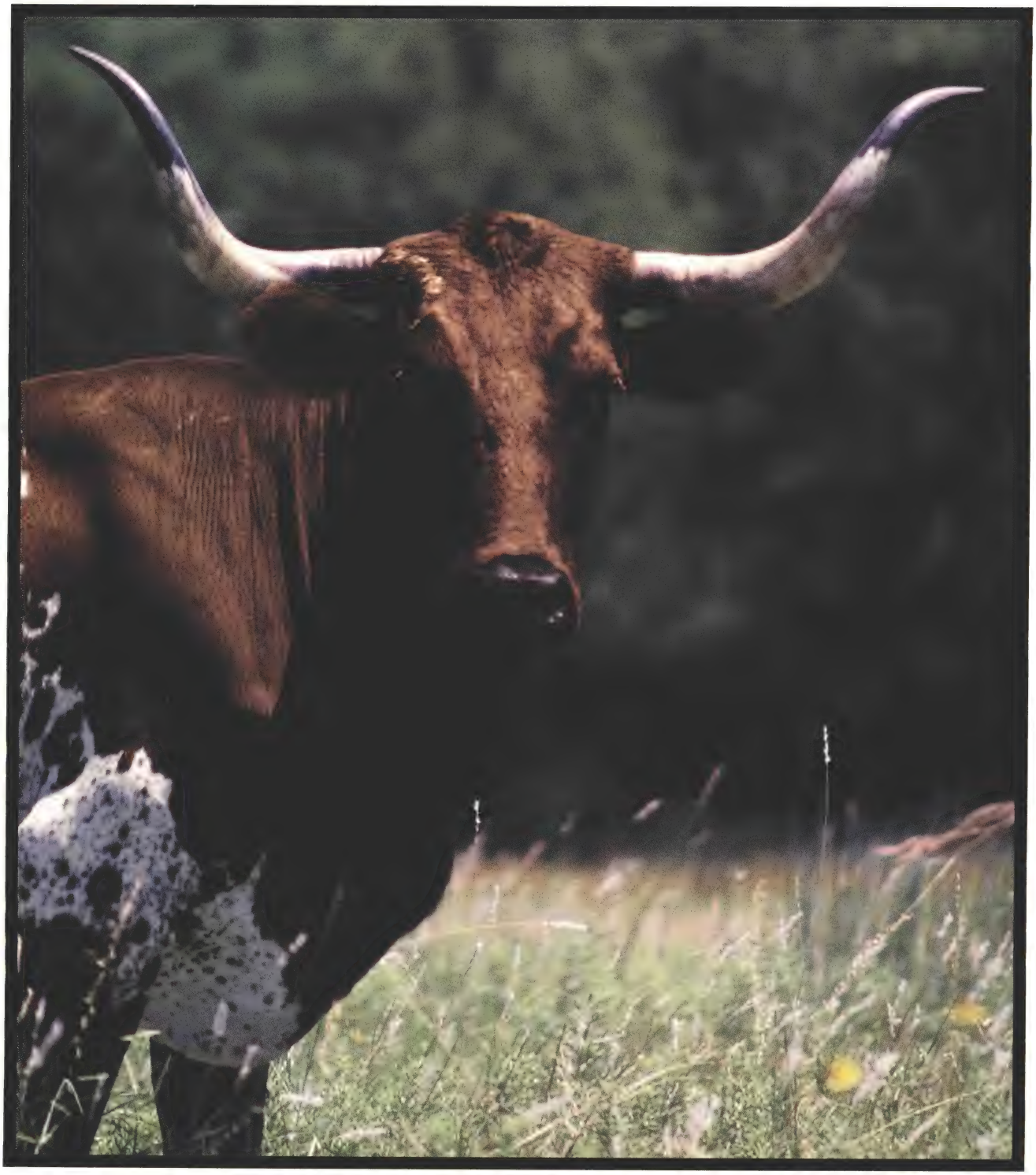
75. The Right Way to Align Text

If you've ever tried to get *WordStar 6.0* to right-justify a header, you know it just about takes an act of Congress. The easiest way is, first type in the line you want right-justified without any dot commands. Then type **<Ctrl>-O]** to justify the text. Then put the dot command **.HEO** at the start of the line. You can do the same thing with footers using the **.FO** dot command. —*Steve Bass*

Steve Bass, George Campbell, Robert J. Lauriston, Daniel Tynan, and John Walkenbach are contributing editors for PC World; *Christina Wood is an assistant editor. They can be reached on PC World Online (see page 8 for more information).*

DO SOMETHING

NEW BREED



AND PUT THE OLD BREED OUT TO PASTURE.

Every cow has its day. But it's time to put that milker out to pasture and make way for the Hyundai 486 stampede. It's time to Do Something New Breed®.

Say goodbye to "cow-shed" engineering and mother-board-of-the-month manufacturing. At Hyundai, we're doing *U.S.-based, end-to-end, value engineering and manufacturing.* That means benchmark-blasting power from the new Hyundai family of 486 Systems.

And with up to *32 Winmarks* of Windows processing power, Hyundai's bulletproof, 32-bit 486 Systems are designed and engineered for your high-throughput applications. For instance, *Local Bus Graphics are standard* on every system, from our entry-level computers up through our top-of-the-line desktops. You'll tear through Windows with our razor-sharp, 32-bit processing. Plus, up to 32 Megapixels of mind-bending *GUI acceleration is standard* with every New Breed 486 from Hyundai. And here's more New Breed value engineering. Our expandable,"warpspeed" *L2 cache architecture is standard* on every Hyundai 486 system.

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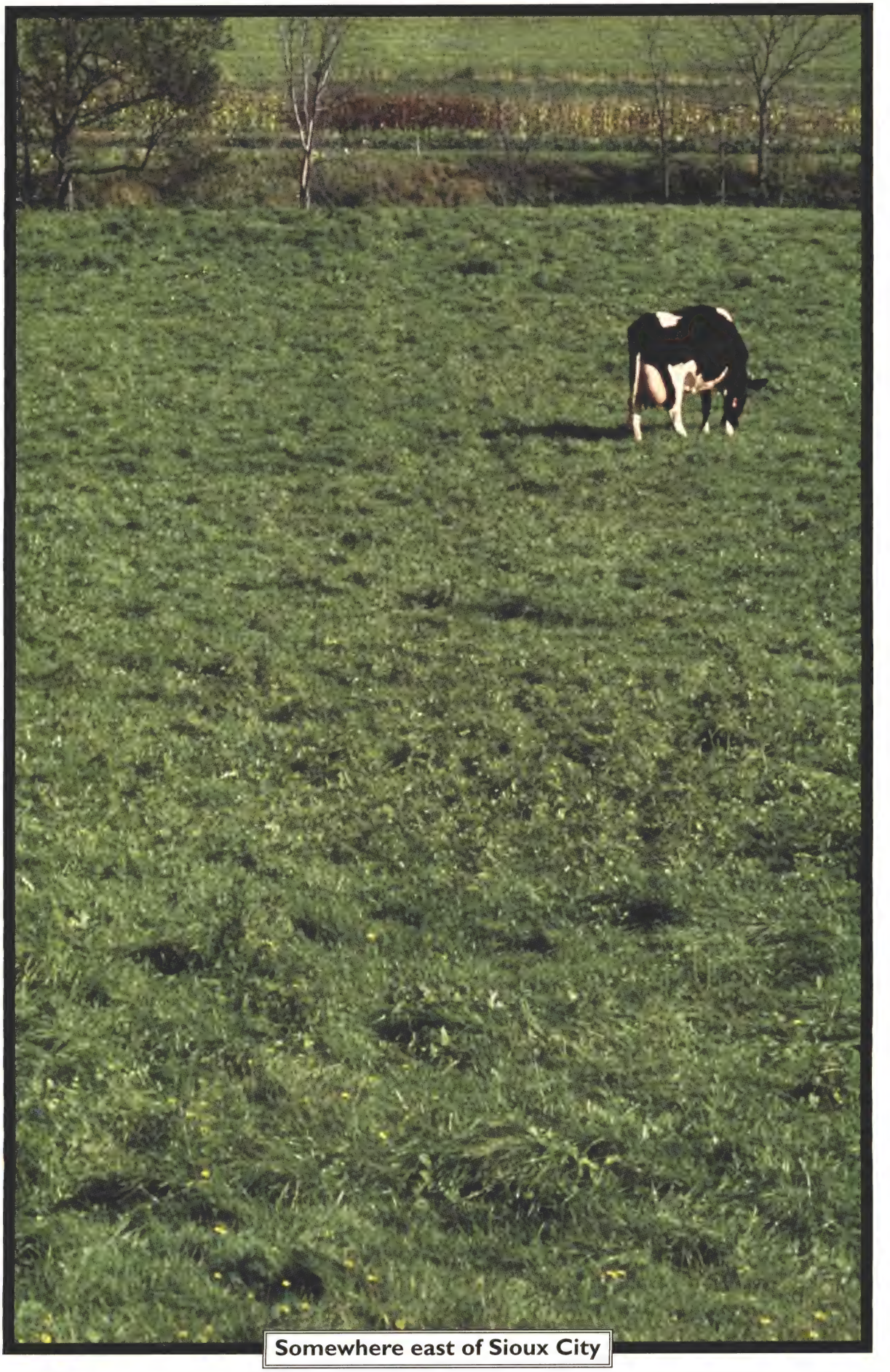
Circle 106 on reader service card



Somewhere east of Sioux City

DO SOMETHING

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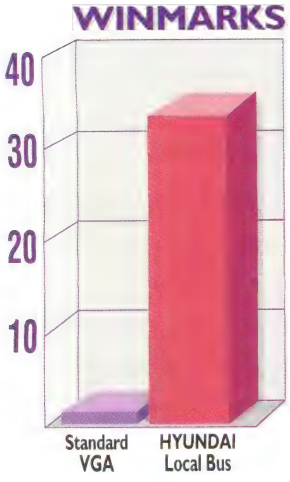

Do something "Longhorn" Local Bus.

That flash you see on the graphics horizon is the image of our Windows processing power triggering the Hyundai 486 stampede.

Your 486 processor was meant to run today's applications. So why rein in all that power? That out-to-pasture, 16-bit VGA card can only deliver 2 Megapixels at best. That's already dated technology. Let her rip with 32-no-blink-bits of "Longhorn" *Local Bus video acceleration*. And with up to 32 Megapixels *standard*, believe it, you'll see an incredible difference in Windows performance.

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486SX/33—$1999

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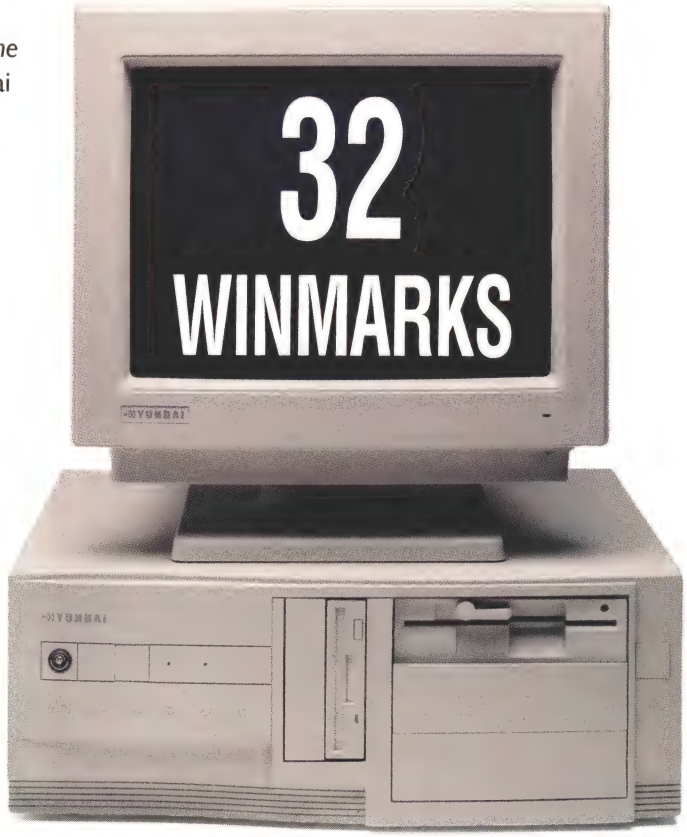
Our 32 Megapixel "Longhorn" Local Bus?... or a 1 Megapixel moo cow? Our "faster-than-a-blink" *Windows accelerator video processing* tied to the speed of your 486 CPU?... or an old-fashioned bottleneck? Our *1MB VRAM controller* producing 1024 x 768 ultra-high, non-interlaced resolution?... or their tired cow VGA? Clearly, the prize goes to the Hyundai New Breed.

Compare our *standard 128KB of zero-wait state cache* with non-cached cows. And don't forget, the Hyundai 433S flexes its processing muscle up to 256KB of cache expansion. This system runs at the head of the stampede!

And we don't just drive the Hyundai stampede, we overdrive it! Double your speed by simply snapping in the *Intel Overdrive™ Processor*. And our advanced "warp-speed" L2 cache and "Longhorn" Local Bus graphics engine give your upgraded system the 32-bit video and fast SRAM you'll need for your higher-speed 486 CPU.

Hyundai 433S

- 33MHz 486SX w/ 8KB integrated cache
- 32-bit VESA local bus UVGA graphics w/1MB VRAM
- 128KB "warpspeed" write-back 20ns SRAM L2 cache (expandable to 256KB)
- Upgradable to 486DX power via Intel "Overdrive" socket
- 4MB system memory expandable to 64MB on system board
- 170MB 19ms IDE HDD, 32KB disk buffer
- 1.44MB 3-1/2" and 1.2MB 5-1/4" FDDs, (2.88MB-ready FDD interface)
- 14" non-interlaced, ultra-high resolution, .28 dot pitch, 72Hz refresh rate, flicker-free, color display w/1024 x 768 resolution, tilt and swivel base
- 2S/1P, integrated PS/2 mouse port
- 5 external drive bays, 2 internal
- 7 expansion slots, including 1 VESA local bus slot
- 200 watt power supply
- 101 keyboard, 2 button mouse
- Built-in virus protection, front keylock, 2 level password
- MS DOS 5.0 and MS Windows 3.1



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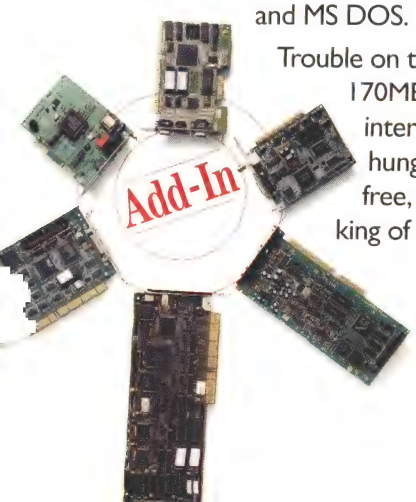

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- 2S/1P, integrated PS/2 mouse port
- 5 external drive bays, 2 internal
- 7 slots incl. 1 VESA Local Bus slot
- 200 watt power supply
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- 2S/1P, integrated PS/2 mouse port
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- 1.44MB 3-1/2" and 1.2MB 5-1/4" FDDs
- 14" non-interlaced, ultra-high resolution, .28 dot pitch, 72Hz refresh rate, flicker-free, color display w/1024 x 768 resolution, tilt-and-swivel base
- 2S/1P, integrated PS/2 mouse port
- 5 external drive bays, 2 internal
- 7 slots incl. 1 VESA Local Bus slot
- 200 watt power supply
- 101 keyboard, 2-button mouse
- Built-in virus protection, front key lock, 2 level password
- MS DOS 5.0 and MS Windows 3.1
- Other hard drive, video, memory, and monitor options available

$2995 Hyundai 466D2

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- 32-bit VESA Local Bus UVGA graphics w/1MB VRAM
- 128KB "warpspeed" write-back 20ns SRAM L2 cache (expandable to 256KB)
- Processor upgradable via ZIF socket
- 8MB system memory expandable to 64MB on board
- 360MB 12ms IDE HDD, 256KB disk buffer
- 1.44MB 3-1/2" and 1.2MB 5-1/4" FDDs
- 14" non-interlaced, ultra-high resolution, .28 dot pitch, 72Hz refresh rate, flicker-free, color display w/1024 x 768 resolution, tilt-and-swivel base
- 2S/1P, integrated PS/2 mouse port
- 5 external drive bays, 2 internal
- 7 slots incl. 1 VESA Local Bus slot
- 200 watt power supply
- 101 keyboard, 2 button mouse
- Built-in virus protection, front key lock, 2 level password
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Number of PCs installed 486_____ 386_____ 386SX_____ 286_____

Tell us about your targeted system configuration

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Architecture	❑ ISA	❑ EISA				
Memory	____MB installed	Cache Memory	❑ 128 KB	❑ 256KB		
Floppies	❑ 1.44MB 3-1/2"	❑ 1.2MB 5-1/4"				
Hard Disks (IDE)	❑ 100MB	❑ 120MB	❑ 200MB	❑ 250MB	❑ 330MB	❑ 500MB
(SCSI) **3.5"**	❑ 360MB	❑ 540MB	❑ 1.2GB			
5.25"	❑ 330MB	❑ 760MB	❑ 1.6GB	❑ 2.0GB		
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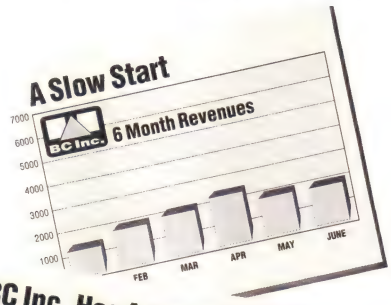

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11" x 17" format. Stop cramming all your BIG news onto a small piece of paper. The WinPrinter 600XL prints your large spreadsheets, presentation materials, and newsletters on 11" x 17" paper.

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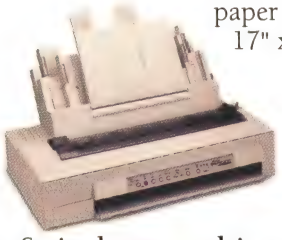

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Windows Fax Soft

With their point-and-click convenience, *Windows* fax programs make faxing from your PC easier than ever. You can prepare a fax message within an application, pop up a fax dialog box, select a destination, have the cover sheet automatically filled in, and send it off while you get back to work. When you get a reply fax, it's captured in the background as you continue to type away. You can then read the fax on screen or send it to your printer.

This sounds like the ideal way to communicate by fax—and when it works, it's close. In fact, you'll find that the biggest headache is getting the programs to work with your fax-modem. Confronted with a hodgepodge of fax conventions—Class 1, Class 2, CAS, and Sierra Sendfax—we learned the hard way that while a fax-modem and a fax program may claim to support the same conventions, they won't necessarily work together (see "Considering Hardware").

Once you've resolved the technical glitches, what really counts is whether a program makes it easy to send and receive faxes. To help us evaluate ease of use, we invited nine *PC World* subscribers to test the seven *Windows* fax programs available at press time that were designed to work with a variety of fax-modems. All our panelists were business professionals who knew their way around *Windows*, but none had ever used a fax program.

We gave each panelist 1 hour with each program. Their mission: to send and receive a single-page text document in the background

MEL LINDSTROM

ware

With a fax-modem and the right software, your PC can have all the power of a fax machine–and more. With help from a panel of business users, we review seven Windows fax packages and come up with a clear winner.

while working in *Microsoft Word for Windows.* Since ease of use is paramount in fax software, the panelists' ratings accounted for half of each program's evaluation score. The remainder of the scoring was based on performance (how invisibly a program operates in the background) and feature set.

We found that the programs vary greatly on all three counts, particularly ease of use. Although some were a breeze, the panelists had to wrestle heroically with others. They discovered many advantages fax software has over fax machines, along with a few drawbacks: Sending and receiving faxes in the background will usually slow your foreground application, although that varies depending on the fax program. Moreover, you'll need to buy a scanner if you want to fax paper documents. And unless you buy a phone-activated power-up device, your PC must remain switched on in order to receive faxes when you're not there.

Some of the panelists commented that with traditional fax machines it was easy and natural "to just stick the pages in the tray and dial the number." But all agreed that if you create the documents you fax on a computer, you can't beat the convenience of a good fax program.

Intel's *Faxability Plus/OCR* is the clear winner in our roundup. It has a comparatively modest feature set, but it performed flawlessly in the background and was our panelists' overwhelming choice for ease of use.

By Bryan Hastings

Delrina's *WinFax Pro* was the runner-up, offsetting a lackluster showing in the ease-of-use category with outstanding marks for features and performance. Eclipse's *Eclipse Fax* came in a strong third, with a powerful set of fax viewing and editing tools.

Facts on Fax

By putting the fax programs through real-world usability tests with nine businesspeople, we were able to pinpoint the most significant features you should consider when buying a fax program. For details, turn to the Features Comparison at the end of this article.

Sending and Receiving Faxes

Fax programs offer so many features that fax machines don't, it's hard to know where to start. Send and receive fax logs automatically track what has come and gone and what's scheduled to go. A fax program's phone book lets you enter frequently called names and fax numbers and attach extra information, such as a phone number, company name, and comments. All the programs we tested, except Bit Software's *BitFax/OCR,* let you create multiple phone books for organizing related numbers, such as those for personal and business use. All offer some kind of search mechanism: by name, by company, and so on. And all the programs, except Sofnet's *Faxit,* provide a way to import database records into the phone book, export phone book records to a database, or both. Importing and exporting capabilities are enormously useful for companies that want to keep all their contacts' address and phone information in a central location, so they can update all records from a single database. *BitFax/OCR,* Caere's *Fax Master,* and *WinFax Pro* make this even more convenient by storing the phone book records in *dBASE* format.

Another feature exclusive to fax programs is easy group faxing. Anyone who's put up with squawks from the mailroom when sending more than a dozen faxes will love this feature—you can send the same fax to a long list of people at the click of a mouse button. In most programs the group fax feature automatically fills out the cover sheet by pulling the necessary information out of the phone book. The most exciting development in group faxing is fax merge, available in Delrina's and Eclipse's programs. Like mail merge, fax merge lets you automatically insert unique information in a fax document for each recipient in the group.

Do you need to forward faxes? With a standard fax machine, you must smooth out the curled-up paper and photocopy it before retransmitting, and reading such faxes is like deciphering street signs through a fogged car window. With fax software, the faxes remain in electronic form, so there's little to no degradation of image quality. The Eclipse program even lets you set up a phone number where you can automatically forward faxes, in case you're away from the office but at another fax-equipped site.

Fax programs also match most of the advanced features of fax machines. Most support transmission scheduling (which lets you set a delayed transmission time to take advantage of low phone rates), and some provide speed dial and the capability to interrupt a phone call to send or receive a fax. This last feature is especially useful for portable-PC users, who are often faxing from hotels and other sites where they're forced to go through a switchboard. Most programs allow you to splice different documents, such as an *Excel* spreadsheet and a *Word* memo, into one fax.

Like regular fax machines, fax programs allow you to send and receive in standard mode (200 by 100 dpi) and fine mode (200 by 200 dpi). The usual trade-off applies: Standard-mode faxes take less time to transmit and receive and occupy less room on the hard disk, but the higher-resolution faxes are easier to read and produce fewer optical character recognition (OCR) errors.

Sending and receiving faxes with a computer poses a few special problems. One is the need to preview the fax before transmitting it, a feature we don't think twice about with a conventional fax machine. Only four of the reviewed products let you preview a fax. Another problem is viewing faxes that arrive upside down, or sideways as in the case of spreadsheets. You *could* print them out (all the programs allow this with a *Windows*-compatible printer), but you may not want to waste time and paper. Instead of forcing you into an unnatural viewing position, all the programs, except Sofnet's *Faxit,* let you flip an upside-down fax. Only the Intel and Sofnet products don't allow you to turn a spreadsheet sideways.

The capability to print a received fax is both a boon and a bane. You get hard copy that looks better than what comes out of a fax machine—but you have to wait at least 1 to 2 minutes per page. Four of the fax programs offer automatic printing for received faxes, which is especially handy for faxes that arrive after work hours.

Best Buy

Intel's *Faxability Plus/OCR 1.0* took the top prize in our roundup. Our test panelists raved about how easy it was to learn and use. The program's performance is also outstanding: When sending and receiving faxes in the background, it leaves the foreground application virtually undisturbed. Both these advantages outweigh the fact that the program lacks some useful features, such as landscape viewing and an image editor.

Fax programs forward legible faxes. With standard fax machines, you must photocopy a fax before retransmitting, and reading such faxes is like deciphering street signs through a fogged car window.

Fax Management

Another problem with PC faxing is disk space: You can fill a hard drive with faxes in no time. When you send a fax document, a bit-mapped image of the document is created that may require 15K to 20K per page for a simple text page, and up to 200K or more for a page with detailed images. To help you avoid unwelcome 'Disk Full' messages, the Delrina, Intel, and ZSoft programs give you the option of automatically deleting faxes after they're sent. Delrina's product also lets you set a delete timer for received faxes you've already viewed. Four of the programs offer fax storage that compresses fax images to a fraction of their original size.

If you prefer to save a tree and view faxes on screen, you'll appreciate some advanced viewing features. Not only do all the programs let you zoom out to see the whole page, some let you choose an area of the fax to magnify. Some also let you display thumbnails of multipage documents. Some programs even have an antialiasing feature, which makes a fuzzy or low-resolution fax more readable.

Fax annotation is one of the hottest new features. The Delrina, Eclipse, and ZSoft programs include image editors for marking up the displayed fax, which you can then retransmit. If you want to edit the fax in another graphics editor, such as ZSoft's *PC Paintbrush*, all the programs let you convert the fax to PCX format. Most also support TIFF, DCX, and standard bit-mapped formats (BMP).

Anyone who's put up with squawks from the mailroom when sending more than a dozen faxes will love the group faxing feature.

Once you've converted the fax to another file format and edited it, the fax program has to reconvert it into a fax to resend it. Only ZSoft's *Ultrafax* lets you attach a binary file to a fax, as long as the recipient has the same program on the other end to "unwrap" the file. This situation is changing, however; it's likely that most fax software will conform to the binary file transfer protocol approved by the CCITT and the EIA, which will simplify the transfer of binary files between fax programs.

All the reviewed programs, except *Eclipse Fax* and *Faxit* (which will have OCR versions close to the time you read this), will let you convert the fax to editable text using optical character recognition (see "Fax and Text Files: A Marriage Made in OCR"). Four of the programs also invert the fax, or convert a "negative" image (white type on a black background) to a "positive" image (black type on a white background). This is ideal for lawyers and other professionals who need to fax microfilm photocopies that they've scanned into a portable computer using a hand scanner.

Only the Bit Software and Sofnet programs lack scanner support. The Caere and ZSoft products work with dozens of scanners, the Eclipse software works with three, and the Intel and Delrina programs support TWAIN, a standard promoted by a coalition of scanner companies including Caere, Kodak, and Hewlett-Packard.

Setup

With all the extra features they pack in, five of the fax programs we reviewed commandeer 5MB or more of your hard drive. In case you don't want to use all these features, Delrina's *WinFax Pro* and

How They Rate

	Performance (out of 10)[1]	Ease of use (out of 50)
Bit Software BitFax/OCR for Windows 2.05	2.5	33.1
Caere Fax Master 1.01	2.5	26.6
Delrina WinFax Pro 3.0	8.4	30.1
Eclipse Fax 1.2	3.3	31.6
Intel Faxability Plus/OCR 1.0	9	40.3
Sofnet Faxit 2.15e	7.5	36.7
ZSoft Ultrafax for Windows 1.0	5	22.2

[1]The system used for our performance tests was the Compaq Deskpro 486s/25M with 8MB RAM, Intel SatisFaxtion Modem/400e, and Microsoft Excel 4.0.

Intel's Faxability Plus/OCR 1.0 is the overall champ, with a winning combination of best performance and ease of use.

More Windows Fax Products

The following *Windows* fax products didn't meet our roundup requirements or shipped too late for our review, but we believe that they're worth noting.

We received three *Windows* fax programs that weren't compatible with any of our three test modems. The first program, *The Fax Window 3.0* ($119 from Frecom Communications; Fremont, CA; 408/955-0555), which was supposed to work with any Class I or Class II modem, has several features that caught our eye.

Most interesting was the ComPort utility that lets you jump between the fax program and any data communications program, such as *Procomm Plus*, without shutting down and then reloading the fax program. (This feature is useful because it's easy to forget to reload the fax program after completing your E-mail tasks.) Frecom also adds a Send Fax menu item in the File menu, so you don't have to change the active printer driver when alternately using the fax-modem and the local printer.

The other two programs were *SuperFax 5.0* ($99 from Pacific Image Communications; Alhambra, CA; 818/457-8880) and *TransFax for Windows 2.0* ($189 from TransFax Corporation; Culver City, CA; 310/641-0439). At press time both vendors confirmed the programs worked with only a few modems. *SuperFax* supports Class I and Class II and offers Dynamic Data Exchange (DDE) links to other *Windows* programs. *TransFax* is a CAS-only program designed to accommodate multiple fax lines to a single computer for users who do high-volume faxing.

Other Programs to Watch

Stand-alone *Windows* fax programs that weren't available for review but should be available when you read this: Smith Micro's *Quick Link II Fax for Windows* ($49 from Smith Micro; Huntington Beach, CA; 714/362-5800), *MicroPhone Pro II* ($195 from Software Ventures; Berkeley, CA; 510/644-3232), *Phoenix Fax for Windows* ($99.95 from Phoenix Technologies; Norwood, MA; 617/551-4000), and *Datafax* ($129 with OCR from Trio Information Systems; Raleigh, NC; 919/846-4990).

ZSoft's *Ultrafax* offer a partial installation option, bringing their space requirements down to 2.5MB and 3MB, respectively.

Once you've successfully matched up a fax-modem with your software, most programs can determine during installation which fax convention your modem uses and automatically adjust to it. *WinFax Pro* and *Ultrafax* also figure out which COM port your modem is plugged into and set the software to it. *WinFax Pro* even creates a file that details the installation process, which helps tech support quickly pinpoint installation problems.

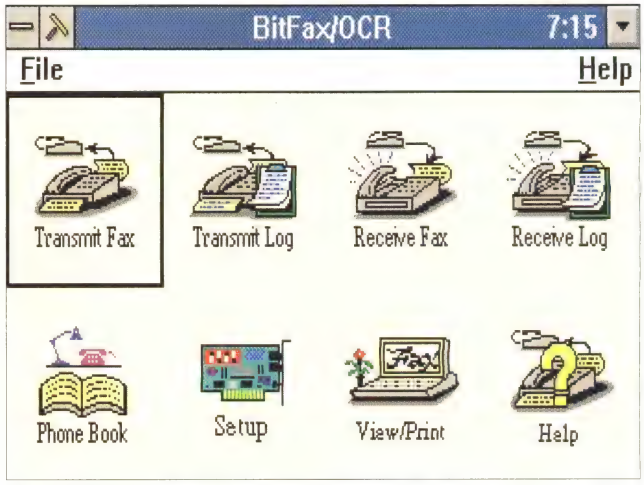
Bryan Hastings is an associate editor for PC World. *He can be reached on PC World Online (see page 8 for more information).*

Bit Software: BitFax/OCR for Windows 2.05

PROS: Straightforward interface, very good OCR
CONS: Disappointing background operation, lean on features

Bit Software's DOS-based communications software has a reputation for being low budget, so we didn't have great hopes for the company's latest product for *Windows*. But the panelists were pleasantly surprised that, although *BitFax/OCR* is an economy model, it's easy to work with.

BitFax/OCR's setup is simple and thorough. You can choose from an unusually wide range of four fax speeds from 7200 to 14,400 bps. If you want, *BitFax/OCR* can automatically begin waiting for faxes and restart the scheduled send-fax queue each time *Windows* is loaded. The few times our panelists had to refer to the manual, they appreciated its completeness and solid organization.



INFORMATIVE ICON GROUP: BitFax/OCR's collection of eight icons makes it easy to find the functions you need.

Eight icons open windows for fax transmission, fax receive, phone book, and other basic functions. When you're sending or receiving a fax, an informative status box pops up, but you can choose to switch this box into the background and return to work. We found this to be one of the best-organized interfaces and very useful for the newcomer. Only one panelist complained that she had to spend time to get the program to work.

The highlight of *BitFax/OCR* is its OCR component, which is

Why Not a DOS Fax Program?

If you do most of your work in *Windows*, a *Windows*-based fax program is the natural choice. If you use *Windows* and DOS, a *Windows* fax program is still the better pick. The reasons don't reflect poorly on DOS fax programs, but rather on the limitations of DOS.

DOS fax programs demand a lot of user attention. First you have to make sure the program supports your local printer. DOS fax programs also require at least one TSR (terminate and stay resident) program—an often cranky piece of code that lurks in RAM and is a common culprit in system crashes. If you are already using a TSR, you'll have to edit your AUTOEXEC.BAT file to rearrange the TSRs in a specific loading order, or else your system can lock up on bootup.

Faxing with a DOS program can be as involved as setting up the program. When you want to send a fax from within an application, you have to manually invoke the TSR with a hot key before using the Print command to send the fax. If you're in a DOS graphics program, however, chances are you'll have to close it before faxing, since many DOS fax programs won't pop up over it.

***Windows* fax programs take much of the pain out of setup and use. Since printer support is already built into *Windows*, the fax program is guaranteed to work with your printer. To send a fax from within an application, you need only print to the fax-modem.**

Since printer support is already built into Windows, a Windows fax program is guaranteed to work with your printer.

Unfortunately, if you hop back and forth between *Windows* and DOS, you still need at least one TSR if you want to receive faxes at all times. Delrina, Eclipse, and Intel supplement their *Windows* programs with TSRs that let you receive faxes when working in a DOS application. If you use DOS applications within *Windows*, you can still receive faxes with a *Windows* fax program. To send faxes, however, we recommend you save the DOS file in a format you can import into the appropriate *Windows* application before faxing.

Finally, sophisticated features such as OCR and advanced image editors and viewers are missing from most DOS fax programs. These extras require the kind of hard disk, RAM, and processing power typically associated with *Windows*-ready computers.

If you use only DOS, you can pick from plenty of good fax programs that are based on that operating system. If you use *Windows* at all, however, you'll find that flexibility and ease of use make a *Windows* fax program the clear choice.

Caere's sophisticated *Anyfax* software. *Anyfax* is unusual in that it handles low-resolution text almost as well as high-resolution text—a big advantage, since the majority of faxes are sent in low resolution to save transfer time and expense. The trade-off? *Anyfax* is very slow: It takes 2 to 3 minutes to convert a low-resolution file, and *Windows* slows down too much to allow effective work.

Anyfax hosts an impressive set of features. When a fax arrives, you can recognize the current page, selected pages, or only a portion of a fax, which saves OCR time. You can choose from dozens of output text file formats, a large number of page layout options, and a landscape or upside-down orientation for the original fax. You can even optimize recognition for any one of 11 languages. If you want to edit the text file immediately after recognition, the Launch option opens your word processor and loads the file.

Although *BitFax/OCR*'s ease of use and OCR are big pluses, these are outweighed by the program's limitations. First, it freezes the foreground application for up to 10 to 15 seconds during *handshakes* (when the modems exchange vital information between fax pages). Also, if your computer has less than 8MB of RAM, the program demands 4MB of contiguous hard disk space, which is treated like RAM, and processing speed slows down precipitously.

Another complaint is the program's lack of more advanced features, such as fax indexing (this allows you to attach a name longer than eight characters to a fax, file it in a folder, and archive it), image-editing tools, and thumbnail viewing. Also, you have to create a group before you can send a group fax (instead of picking a list on the fly from the phone book), and the groups are identified only by numbers. It would have been nice to have some kind of incoming fax alert.

Fax Master's forte is its OCR proofreading system. Its spelling checker corrects misspelled words on the OCR'd document, and you can pop up sections of the original fax for instant proofreading.

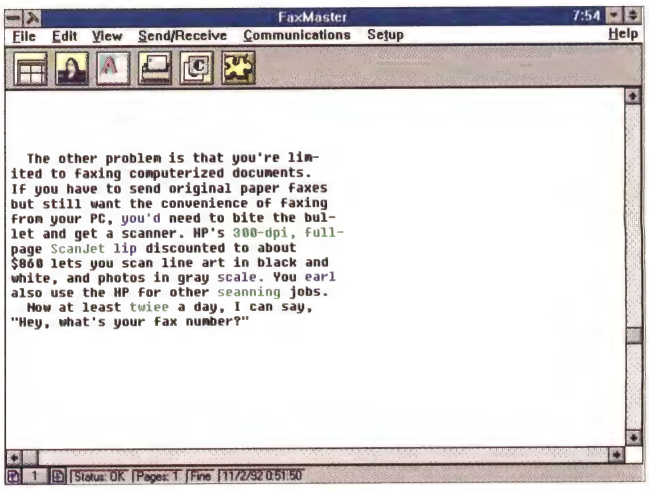
Although *BitFax/OCR* is reliable and easy to use, we can't recommend the program given its less-than-desirable performance and basic feature set. Besides, if what you're looking for is a bare-bones but easy-to-use program, Sofnet's *Faxit* is a better deal. The current version lacks OCR, but it offers superior performance and costs almost the same as *BitFax for Windows* without OCR.

BitFax/OCR for Windows 2.05, Bit Software; 510/490-2928, 510/490-9490 (fax). List price: $129, *BitFax for Windows 2.0* without OCR $79. **Reader service no. 690**

Caere: Fax Master 1.01

PROS: Very good OCR and proofreading system
CONS: Poor performance, hard to use, average feature set

When Yogi Berra said, "It's déjà vu all over again," he could have been talking about Caere's *Fax Master.* Several panelists wondered if it was the same program as *BitFax/OCR.* It didn't take long to discover that Caere and Bit made a technology trade: *Fax Master* incorporates the *BitFax 2.01* send-fax engine, and *BitFax/OCR 2.05* has Caere's *Anyfax* OCR engine.



SPELLING CHECKER: Caere's Fax Master not only turns your fax into a text document, it highlights corrected words in one color (blue here) and suspected misspellings in another (green)—but it isn't perfect.

Even so, *Fax Master* wasn't the equal of *BitFax/OCR* in our overall evaluation. Disappointment set in at installation. We discovered a quirk in using *Fax Master* with our Intel SatisFaxtion 400e test modem: To get *Fax Master* to work, we also had to install Intel's *SatisFaxtion* and *Faxability* software. None of the other programs we reviewed required *Faxability* as an adjunct. Another problem was the poorly organized user manual, with setup steps listed in the wrong order.

Things didn't improve much after the program was set up. Several panelists found the interface confusing. One example of the interface's poor organization is that the tools for manipulating an OCR version of a fax were spread throughout three menus. Panelist Greg Immel echoed our criticism of *BitFax/OCR*'s group fax control: Like that program, *Fax Master* doesn't let you create a recipient group on the fly.

Fax Master has some useful features, such as a speed-dial button and the capability to zoom, flip, and turn faxes sideways. But it lacks features common to better fax programs, such as an image editor, a fax previewer, antialiasing, and the capability to frame an area to zoom. Performance was another problem. In our tests on the Intel 400e modem, *Fax Master* tied for last place in performance because the foreground application slowed or stopped completely while *Fax Master* was transferring a fax in the background.

Fax Master's forte is its *Anyfax* OCR software and its OCR proofreading system. When you begin to edit a new text file in *Fax Master*'s mini word processor, which is tailored for editing OCR text, the automatic spelling checker highlights in different colors words it has corrected and those it suspects are misspelled. To further assist proofing, you can double-click on a highlighted word, and a verification window will pop up over the OCR'd text, showing the relevant area of the original fax image for comparison.

Although *Fax Master*'s OCR proofreading tools are useful, this advantage is overshadowed by the program's so-so feature set, its problematic performance, and its poorly organized interface and documentation.

Fax Master 1.0, Caere Corp.; 800/643-3915, 408/395-7000, 408/354-2743 (fax). List price: $149. **Reader service no. 691**

Delrina Technology: WinFax Pro 3.0

PROS: Packed with features, excellent background performance
CONS: Difficult to learn

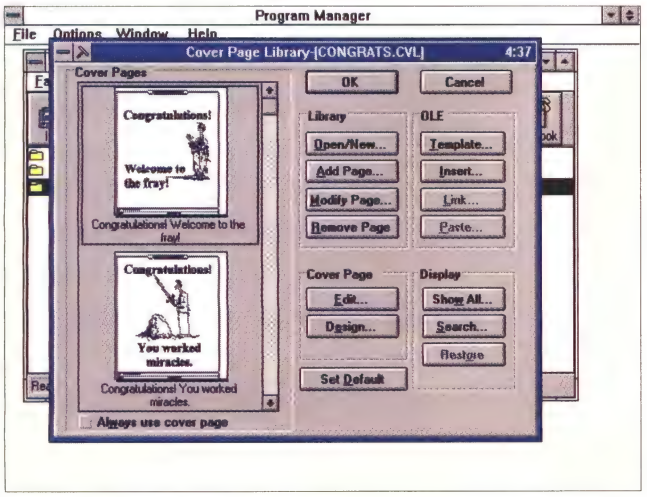
Delrina's *WinFax Pro 2.0* has been popular as one of the few *Windows* fax programs available until recently. Version 3.0 outpaces its predecessor with a potent mix of features and performance. In fact, these aspects of the program are so outstanding that they outweigh our panelists' low ranking for ease of use. While one panelist allowed that *WinFax Pro* was "fairly straightforward," several remarked on how hard it was to use.

If you decide that powerful features and performance are your highest priorities, then *WinFax Pro 3.0* is your program. It comes replete with advanced fax viewing and editing tools, Caere's *Anyfax* OCR engine, an advanced phone book, and sophisticated fax document management. It also has a 101-page library of sample cover sheets that you can customize. And *WinFax Pro 3.0*'s performance rates second only to Intel's *Faxability Plus/OCR* in smooth background operation.

If you decide that powerful features and performance are your highest priorities, then WinFax Pro 3.0 is your program. It comes with advanced fax viewing and editing tools, and more.

Delrina has certainly gone the extra mile with features. For example, the fax-viewer's zoom lets you place a box of fixed size over the precise area you want to enlarge; it also lets you fit ten fax pages to a screen for thumbnail viewing. Not only can you flip pages upside down, you can flip all the pages in a multipage fax at once. (Our only complaint is that the page rotation feature is very slow.) The image editor comes with a full complement of tools and lets you save your changes to a separate overlay file instead of having to permanently merge them into the original fax. Text annotation is done using a full text editor with word wrap, a dozen typefaces, various text styles, and justification tools.

Besides letting you create groups and multiple phone directories, the phone book manager can exchange records with databases and store its records in *dBASE* format. Most impressive is the capability to directly attach an external database to *WinFax Pro*, which means you don't have to update the phone book from the company database each time you want to send faxes to a large group. If you choose to use the phone book as a database, however, you'll find a healthy range of fields. Globe-trotters will love the extensive prefix and suffix options for phone numbers, which include international and country codes.



COVER SHEET LIBRARY: Delrina's WinFax Pro 3.0 sports 101 cover sheets that you can edit easily.

Do you often need to collect files from different applications to send together as a fax? If so, you'll appreciate *WinFax Pro 3.0*'s strong document collection features. You can keep files individually or in folders and use a search function to find them. For easy access, you can organize any fax using a thumbnail display. You can also preview attachments before adding them and remove them if you change your mind before the fax goes out.

Delrina uses Caere's *Anyfax* OCR engine, and it differs little in performance from the Bit and Caere OCR systems. Delrina has the same special text recognition and proofing features found in Caere's *Fax Master. WinFax*'s advantage is that you can call up the proofing window that shows the original fax at any time, not just when you highlight a misspelled word, as in Caere's product.

WinFax Pro's disappointing lack of intuitive operation is certainly a minus when first learning the program, but if you're willing to accept a steeper learning curve, the payoffs with *WinFax Pro* are strong performance and an impressive feature set. *WinFax Pro 3.0* was runner-up in our overall evaluation.

WinFax Pro 3.0, Delrina Technology; 800/268-6082, 416/441-0774, 716/855-3676 (U.S. only), 416/441-0774 (fax). List price: $129.
Reader service no. 692

Eclipse: Eclipse Fax 1.2

PROS: First-rate fax viewing and editing tools
CONS: Slows foreground application during fax send and receive

Eclipse is a small start-up that touts its admirable mission to save trees by creating the paperless office. But we couldn't help wondering: Would *Eclipse Fax* match up to the heavyweights?

We were in for a surprise. The program did respectably well in the ease-of-use test, with most panelists awarding it decent if not top marks in that category. Phyllis Goldman called it "fairly intuitive, with good status dialog boxes," and Cliff Lawson liked how easy it was to set up group faxing. But where Eclipse really shines is in its feature set. Although at press time it lacked OCR (an OCR version should be shipping soon with the Ocron OCR technology), *Eclipse Fax* has a powerful fax viewing and editing system, especially for managing multipage faxes. In fact, *Eclipse Fax* turns out to be the sleeper of this roundup.

The program works its magic through three *tool bars*, which are a series of icons you can click on as alternatives to menu commands. The View tool bar allows you to rotate faxes, "best fit" them on screen (to see the whole fax in as large a size as possible), jump to any page in a multipage fax, forward the displayed fax to another fax machine, and view two nonconsecutive pages. Want to quickly

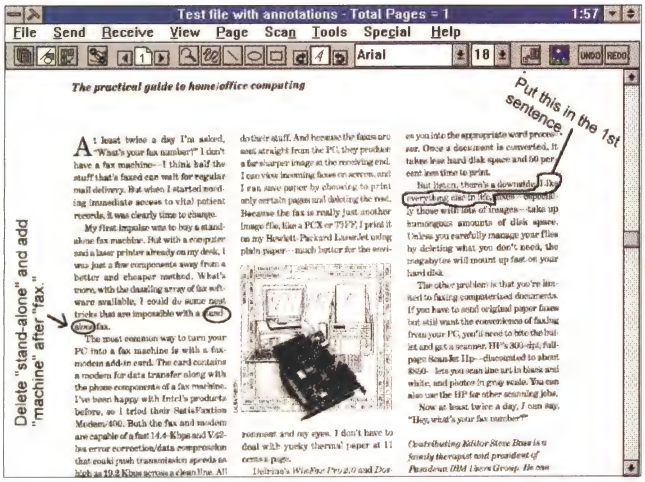


IMAGE EDITOR: Eclipse Fax lets you place text on a fax at an angle, handy for margins and other tight spots.

page through the fax? The Quick Read buttons enable you to page through the fax a half-page at a time.

Using the Edit tool bar comes closer to the convenience of marking by hand on paper than any of the other fax programs. You can add lines, ellipses, and rectangles or use a freehand drawing tool. You can also place text onto the fax at any angle—ideal for adding vertical lines of text on margins.

Eclipse Fax's Thumbnail tool bar lets you work with miniature versions of fax pages; simply click on file names to add faxes to the thumbnail display. Another tool permits you to organize the fax pages in the proper order and send them as a single fax. The screen repaints almost instantly when switching to a new fax page because pages are displayed in a rough "draft" version. The Clearview option lets you see a sharper image of a fax.

We found that making those inevitable last-minute changes, such as adding a prestored signature on the cover sheet or attaching a spreadsheet to a memo, is particularly easy with *Eclipse Fax*. You can also give faxes meaningful file names, because the Index feature allows up to 50 characters per name.

Pleasant surprises pop up throughout this program. You can begin a fax transfer during a current call (except when using a CAS modem). You can save time by specifying and printing only the area of a fax that you need. And if you jump between DOS and *Windows*, you'll be glad to know you can receive faxes in DOS through the aid of a TSR program. This is not a full DOS product, however, since you can't send faxes from DOS.

Eclipse Fax's biggest drawback is its relatively slow performance. The foreground application froze for long periods before and after a

Fax and Text Files: A Marriage Made in OCR

If you've longed to be able to receive a fax and open it up in your word processor, the wait is over. Optical character recognition (OCR) software, now built into most *Windows* fax packages, can turn those graphics-based files into ordinary ASCII text.

All the reviewed programs except *Eclipse Fax* and *Faxit* come with OCR (and both of those have OCR versions due out by the time you read this). While stand-alone OCR packages have been available for years, they won't necessarily work with all fax packages.

The Real-World Test

OCR sounds like magic, but in fact many things can wreak havoc with the translation process: the varying fonts and point sizes of characters, line spacing, skew (the slight right or left angle at which the fax document was sent), and even phone-line noise that adds black dots to the fax at random. Also, nontext images such as photos, as well as multiple text columns on a page, can confound some OCR systems.

The developers of the top OCR systems claim 99 percent accuracy in ideal conditions. With faxes, that would include large type, no line noise, and a high-resolution fax. But that 99 percent figure still means 60 mistakes per 1000-word page. In real-life use, the number of errors is much greater. The fact is, even the best OCR packages still require you to proof what you scan. Caere and Delrina have added proofreading tools to their programs' OCR systems, including a spelling checker and a small window showing the matching piece of the original fax so you can compare the words in question.

Even the best OCR packages still require you to proof what you scan.

The bottom line on OCR: If it's accurate enough that scanning and proofing the fax take less time than retyping it, it's worth consideration. To determine the accuracy and speed of built-in OCR, we devised a pass/fail accuracy test based on three types of documents, and measured how long each OCR system took to convert the text in each document. We expected the first document to be relatively easy to recognize. The print was dark, and the typeface was a relatively large sans serif font. The next one had smaller, lighter, serif type, which can be more difficult to convert into text. The third was a photocopy of a newspaper article, with small, fuzzy type packed tightly together, making it still more challenging for the OCR system.

Best of the Bunch

Since the Caere, Delrina, and Bit programs use Caere's *Anyfax* system, all the programs successfully recognized the text in all three documents with little variation in performance times. Intel's *Faxability Plus/OCR*, which incorporates Calera's *Wordscan 1.1*, also passed the test on all three documents and beat the first three programs handily in the speed tests. ZSoft's *Ultrafax*, using the Ocron OCR system, had the fastest recognition times but tripped up over the newspaper article. The winner is Intel's *Faxability*, which performed best overall in the speed and accuracy tests.

If you already own Delrina's *WinFax Pro 2.0* or Sofnet's *Faxit*, you can add OCR using Calera's *Faxgrabber* ($149 from Calera Recognition Systems; Sunnyvale, CA; 408/720-8300). *Faxgrabber* will also translate any faxes in the PCX format.

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Circle 244 on reader service card

Considering Hardware

Most *Windows* fax programs make faxing a breeze. But getting one to work with your PC and fax-modem can be tricky.

First, is your PC powerful enough? Generally speaking, if your PC can run *Windows*, it can run *Windows* fax software. Be aware that background faxing imposes heavy demands on the RAM, the processor, and the hard disk, so you'll want to be well stocked with all three. We recommend at least a 25-MHz 386DX processor, 4MB of RAM, and 80MB of hard disk space. Also, if you use your phone frequently, consider getting a dedicated fax line.

Matching Software to Modem

Next, you need to consider fax software and fax-modem compatibility—technical territory that's like quicksand waiting to trap the unsuspecting buyer. While you don't have to think twice about matching a third-party E-mail communications program, such as *Procomm Plus*, with any brand of data modem, fax software is a different matter. A fax-modem and a fax program may each support any of the four fax conventions. But even if they support the same ones, they still may not work together.

The seven programs reviewed here support the Class I, Class II, and CAS conventions. All except *Eclipse Fax* also support the Sierra Sendfax convention, as do many send-only fax-modems. (All these protocols fall under the Group III fax standard, which means they will let you send faxes to standard fax machines.) Because Class I is the only true standard and the most reliable of the three, we tested the software using Class I whenever possible. (At press time, Class II was in the final stages of becoming an internationally accepted standard.) While Class II and CAS offer the promise of smoother background faxing than Class I—a Class II or CAS modem can assume some of the computer's processing—both conventions have been plagued with uneven implementations by modem-chip makers and software developers. To further complicate matters, some fax-modems are proprietary and work only with their bundled software.

Protect Yourself

Your best bet currently is to find a modem and a fax program that both support Class 1. But even that's not an ironclad guarantee. The Intel, Sofnet, and ZSoft programs failed to work with one of our Class 1 test modems—the U.S. Robotics Sportster 14,400—even after some of the software vendors had assured us it was "no problem." In the end we were able to run all the programs except for ZSoft's *Ultrafax* using Class 1 on the Intel SatisFaxtion Modem/400e. *Ultrafax* could send, but not receive, faxes with that modem.

The rule of thumb: To make sure a fax-modem will operate with your fax software, call the software company and ask if its program has been tested with your make and model of fax-modem. To protect yourself, ask for a money-back guarantee in case the software and modem aren't compatible. But even if they are, the only way to be assured that they will perform well together is to try them out yourself.

fax page was transmitted, placing *Eclipse Fax*'s performance fifth among the seven programs. Other shortcomings include the inability to export phone book fields to a database and a bug that causes a small portion of the right side of resized areas of the fax to be missing on the printout.

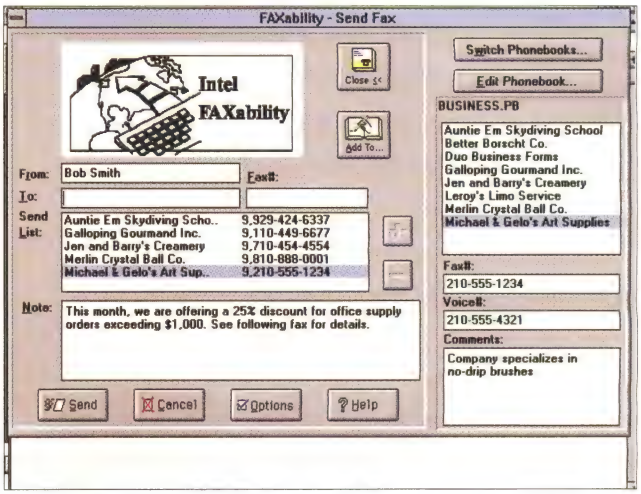
Lackluster performance notwithstanding, *Eclipse Fax* earned its place in the sun. With decent marks for ease of use and a first-rate fax viewing, editing, and indexing system, *Eclipse Fax* ranks a solid third in overall value. The upcoming OCR upgrade should make this an even more attractive package.

Eclipse Fax 1.2, Eclipse; 312/541-0260, 312/541-0514 (fax). List price: $119, upgrade with OCR $50. **Reader service no. 693**

Intel: Faxability Plus/OCR 1.0

PROS: Top-notch background performance, excellent OCR, easiest to use
CONS: Limited fax viewing options, no image editing, high price

Intel's product turned out to be the darling of our panel and of this reviewer. As Christina Smith said, "*Faxability* is head and shoulders above the rest." The rest of the test team agreed, giving it the highest ease-of-use rating in the bunch. The program's menu system is so intuitive that beginners can get up and running



GROUP FAXING: Intel's Faxability Plus/OCR lets you create a group fax list on the fly. Highlight a name in the phone book directory at right and click on the + button to add a recipient to the Send List.

in just a few minutes. We also loved the way *Faxability* allows you to work virtually uninterrupted while faxing in the background.

Faxability's group fax feature conveniently lets you send faxes to a predefined group or create a pick list by clicking on names in the phone book directory. Newcomers will also appreciate the way *Faxability*'s OCR system is smoothly integrated into the program. To create an editable text file from a fax, just choose the Save As menu item, which presents a slew of graphics and text file formats you can choose for your output. If you pick a text format, *Faxability* invokes OCR to generate the file. *Faxability* uses Calera's *Wordscan 1.1* as its OCR engine—a good choice, since *Faxability*'s performance ranked best in our OCR speed and accuracy tests.

You won't find a better program for log management. In addition to the send and receive logs, *Faxability* lets you create logs in which

you can display events based on many different criteria, including status (Read, Unread, Sent, Pending, Error/Abort), sender/recipient name, time sent or received, and newest or oldest entry first. When a new log is created, the program automatically copies all the entries selected by your filter from the original send and receive logs, and a new log icon appears at the bottom of the desktop.

Faxability's fine degree of control over your laser printer rivals that of many word processors. Options include a choice of eight paper sizes, manual feed or envelope, output resolution, page orientation, and duplex printing with the appropriate printer. The Fonts option lets you install either soft or cartridge fonts and scalable typefaces if you're using a Hewlett-Packard LaserJet Series III printer.

Faxability's feature set, while extensive, falls short of the mark in a few areas. Its fax viewing options are basic: a few levels of zoom, best fit, fax invert, and page flip. We were surprised there's no way to turn a page on its side for landscape viewing—this isn't the program for viewing spreadsheets. Although its OCR system worked very well, it lacks proofreading enhancements, so you have to go into your word processor to check the document. We were most surprised that a program of this caliber provides no image-editing tools.

These are gaps in *Faxability*'s otherwise healthy feature set. If you've got 6MB of hard disk space available, you can't go wrong with this full-featured program that tops the charts.

Faxability Plus/OCR 1.0, Intel Corp.; 800/538-3373, 503/629-7354, 503/629-7227 (fax). List price: $249, *Faxability Plus* without OCR $119. **Reader service no. 694**

Sofnet: Faxit 2.15e

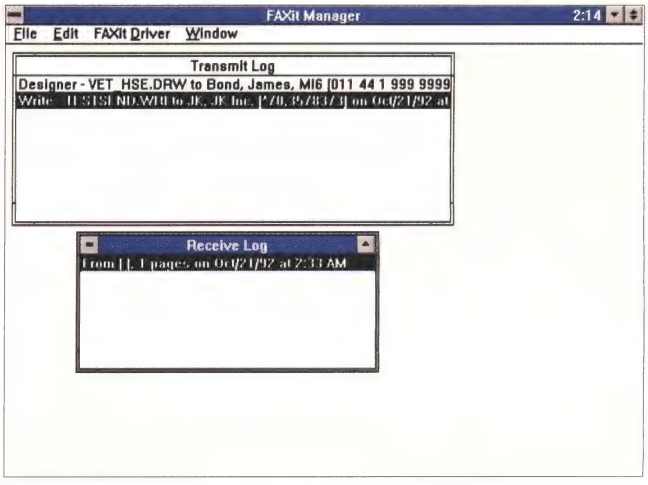
PROS: Reliable program with excellent ease of use
CONS: Lacks some common fax management tools

Sofnet's *Faxit* is an inexpensive, bare-bones package. It doesn't currently boast OCR (although an OCR version will be out when you read this) or an image editor. You can't exchange phone book records with a database. And it doesn't even let you flip faxes that arrive upside down. As one of Sofnet's technicians put it, "*Faxit* is a glorified printer driver that sends files to a fax-modem."

But this no-frills program does the basics very well and demands only 1MB of disk space. Our performance tests on the Intel 400e modem showed only momentary foreground interruption during handshakes, causing barely a hiccup in overall operation. Although a few of the testers remarked on the lack of an incoming fax alert when a fax is received while working in the program , the panel's overall assessment was that *Faxit* is easier to use than any other program except Intel's *Faxability Plus/OCR.*

As our panel discovered, using the send and receive fax logs is no challenge: Each log lists the file, the recipient, and the send date and time. To view the fax, you simply double-click on the fax listing in the log. It's a cinch to forward received faxes and resend them: Just use the Print command while viewing the fax. *Faxit* also has one of the most comprehensive lists of modem drivers—a total of over 80 in all.

Faxit is not without its quirks. Although this is a *Windows* program, it relies on a DOS TSR, which can be troublesome for people who use other such programs on their computer. In scheduling faxes, we found it strange to have to specify the amount of time we



SIMPLE INTERFACE: Sofnet's Faxit features a Transmit Log and a Receive Log that list basic information on each fax, including the application and file name for the faxed document.

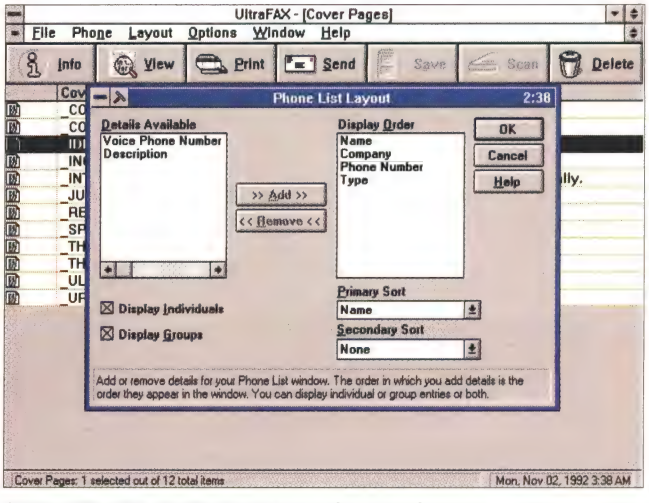
wanted to delay the fax, instead of just entering the time at which to send it. We also found the manual a little disorganized. Low-resolution received faxes appeared squashed on the screen, and error messages were sometimes inaccurate. On the whole, however, *Faxit* is a solid, reliable program, placing fourth overall.

Faxit 2.15e, Sofnet; 404/984-8088, 404/984-9956 (fax). List price: $99, *Faxworks Plus* upgrade with OCR $99. **Reader service no. 695**

ZSoft: Ultrafax for Windows 1.0

PROS: Terrific feature set
CONS: Difficult to set up, confusing interface

Ultrafax has the richest set of features of the seven programs we reviewed, although *Eclipse Fax* comes close. *Ultrafax* also performed with no interruptions to the foreground application while sending faxes, but it failed to receive faxes using our performance test modem. Even worse, *Ultrafax* ranks lowest in ease of use. All but two of the panelists had problems with this program, ranging



ORGANIZING THE PHONE BOOK: ZSoft's Ultrafax lets you set the order for displaying information on phone book entries. You can also use any two phone book fields for primary and secondary sorts.

from Kathy Shultz's struggles with setup to Cliff Lawson's conflicts with complicated menus. Thom Stark deemed *Ultrafax* "extremely counterintuitive." Several panelists softened their stance during the receive-fax tests, which they performed later.

The program's *Ultrafax* Manager desktop window contains five smaller windows, which you can size or position as you like. These windows contain the Phone Book, the In Box (received-fax log), the Out Box (sent-fax log), the Cover Pages Library, and Document Storage. Using the Layout command, you can modify the order in which information is displayed in each of the five windows, such as the order of the fields in the phone book. You can also do extensive sorts, such as primary and secondary sorts on the phone book entries, received faxes, and sent faxes. The most frequently used commands have been grouped together on a convenient button bar along the top of the *Ultrafax* desktop.

It's almost criminal that *Ultrafax* is generally so difficult to work with, because it offers an astounding array of features. The program's robust fax viewer comes with tools to flip, rotate, and invert the fax, and to enhance it through antialiasing, as well as a noise-removal function that wipes off spurious specks caused by phone static during transmission. The fax viewer can also display thumbnails of all the pages in a multipage fax. Even stronger are the image-editing tools, which allow you to mark up the fax with lines, circles, boxes, and freehand drawings, as well as place text on the

FEATURES COMPARISON

Delrina, Eclipse, and Zsoft Lead the Pack for Best Features

● Yes
○ No

	Bit Software BitFax/OCR for Windows 2.05	Caere Fax Master 1.01	Delrina Technology WinFax Pro 3.0	Eclipse Fax 1.2	BEST BUY Intel Faxability Plus/OCR 1.0	Sofnet Faxit 2.15e	ZSoft Ultrafax for Windows 1.0
Standard features							
List price	$129	$149	$129	$119	$249	$99	$119
CPU	386	386	286	286	286	286	386
RAM required (MB)	4	4	4	2	4	1	2
Hard disk required (MB)	5	8	7	3	6	1	5
Works with Windows 3.1	●	●	●	●	●	●	●
14.4-Kbps faxing with appropriate modem	●	○	●[1]	○	●[2]	●	●
Setup							
Setup determines COM port	○	○	●	○	○	○	●
Partial program install	○	○	●[3]	○	○	○	●[4]
Modem convention auto-match	●	●	●	○	●	○	●
Installation audit trail	○	○	●	○	○	○	○
Automatic uninstall	○	○	○	○	○	○	●
Sending faxes							
Multiple phone book directories	○	●	●	●	●	●	●
Phone book search	name	first name, last name, company	all fields	last name, company	name	name	all fields
Customizable phone book display	○	○	●	○	○	○	●
Exchange phone book and database records	●	●	●	●[5]	●[6]	○	●
Phone book records kept in dBASE format	●	●	●	○	○	○	○
Fax merge	○	○	●	●	○	○	○
Send fax preview	○	○	●	●	○	●	●
Send fax during call	○	●	○	●[7]	●	○	●
Collect multiple files into fax	●	●	●	●	●	○	●
Send partial page	○[8]	●	●	●	●	○	○
Resend faxes	●	●	●	●	○[9]	●	●
Receiving faxes							
Incoming fax alert	○	●	●	●	●	●	●
Receive fax during call	○	○	○	●[7]	●	○	●
Reception of incomplete fax	●	●	●	●	●	●	●
Option to print received faxes automatically	○	●	●	●	○	○	●
Print partial fax page	○	○	○	●	●	●	○
Automatic fax forwarding	○	○	○	●	○	○	○

fax in a wide range of fonts, styles, and point sizes. If you're done looking at the fax but still want to keep it, *Ultrafax* can compress and file the fax and let you find it later using keywords.

Ultrafax also has extensive phone book features, terrific scanner support, and, of course, OCR (from Ocron), which performed well in the speed and accuracy tests. ZSoft also tossed in *ATM* PostScript fax fonts, sample cover pages, and tutorial documents.

One of ZSoft's most intriguing features is Ultrafax Transmission. This allows you to attach a binary file of the original document to an outgoing fax so the recipient has an error-free editable file of the fax to work with. But Ultrafax Transmission needs to connect to another *Ultrafax* system in order to work.

As tantalizing as its features and performance are, *Ultrafax* was not quite ready for prime time when we tested it: It was the only program that didn't let the Intel 400e modem receive faxes. Taking into account the trouble our panelists experienced with setup and the interface, we had to rank it fifth overall in this roundup. This program is one to keep an eye on, however. Once ZSoft designs a friendlier interface, its appeal should skyrocket.

Ultrafax for Windows 1.0, ZSoft; 800/227-5609, 404/428-0008, 404/427-1150 (fax). List price: $119. **Reader service no. 696**

For more information about all products in this article, circle reader service no. 903.

	BitFax/OCR for Windows 2.05	Caere Fax Master 1.01	Delrina WinFax Pro 3.0	Eclipse Fax 1.2	BEST BUY Intel Faxability Plus/OCR 1.0	Sofnet Faxit 2.15e	ZSoft Ultrafax for Windows 1.0
Fax management							
Fax flip (180 degrees)	●	●	●	●	●	○	●
Turn fax on side to view (portrait to landscape)	●	●	●	●	○	○	●
Zoom range (percent of original size)	25, 50, 75, 100, 200	25, 50, 100, 200	25, 50,100	1 through 4800	25, 50, 100, 200	25, 50, 100, 200	25, 33, 50, 66, 75, 100, 200, 400, 600[10]
Can size area to zoom	○	○	○[11]	●	●	○	○
Fax invert	○	○	○	●	●	●	●
Capability to save rotations/inversions	●	○	●	●[12]	○	●	●
View multiple pages on one screen	○	6 (VGA), 12 (SVGA)	10 (VGA)	limited only by screen resolution	4	○	8
Antialiasing	○	○	●	●	○	○	●
Copy and paste images onto fax page	○	○	○	●	●	○	●
Image editor	○	○	●	●	○	○	●
Save fax portion	○	○	○	●	●	●	●
Sent fax auto-delete	○	○	●	○	●	○	●
Timed delete of received fax	○	○	●	○	○	○	○
Fax compression for storage	○	●	●	●	○	○	●
Export fax to graphics file formats	BMP, PCX, DCX	PCX, TIFF, PICT	BMP, PCX, TIFF, WinFax	PCX, DCX, TIFF	PCX, TIFF	PCX, DCX, TIFF	BMP, PCX, TIFF
OCR engine	Caere Anyfax	Caere Anyfax	Caere Anyfax	none	Calera Wordscan 1.1	none	Ocron
Scanner support	○	42 scanners	TWAIN scanners	HP, Microtek, Fujitsu	TWAIN only	○	more than 50 scanners
Documentation							
Quick-start guide	●	○	●	●	●	○	●
Troubleshooting section	●	●	●	●	○	○	●
Service and support							
Daily support (hours)	8.5	9	10	8	10	9.5	9
BBS	●	●	●	○	●	●	●
On-line	○	○	CompuServe	CompuServe, MCI	CompuServe	CompuServe	CompuServe
Fax-back	○	○	●	○	●	○	○

[1] Class I and II only.
[2] Only with SFAX/400 modem.
[3] Minimum install is 2.5MB.
[4] Minimum install is 3MB.
[5] Import from database only.
[6] Must download free utility from Intel's BBS.
[7] Except in CAS.
[8] Cover page only.
[9] Resends only those that weren't sent successfully.
[10] Plus one custom setting between 10 and 600 percent.
[11] Lets you place a box of fixed size over area to zoom.
[12] Except 90- and 270-degree rotations.

Here's How

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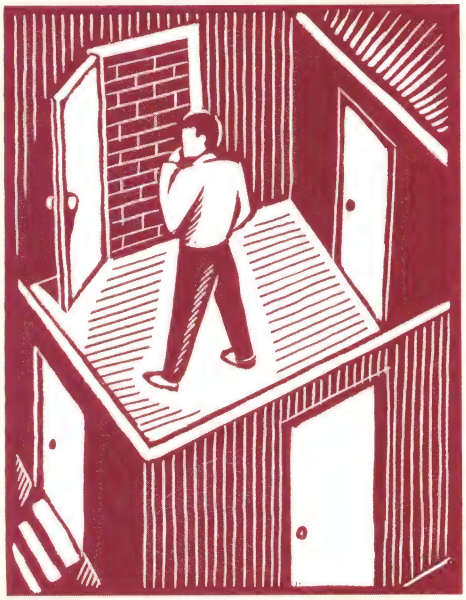
HELP LINE Q & A



Tip of the Month

GETTING THE MOST FROM UNDO: Every program worth its salt includes an undo command to protect you from your own mistakes. You probably know how to undo an action in your favorite program. In most *Windows* applications, for instance, you select Edit • Undo or press <Ctrl>-Z or <Alt>-<Backspace>, and whatever you did last—typing, deleting, formatting—gets undone. But you have to act immediately after making the error, or you lose your chance to recover.

Undo has less obvious uses as well. For instance, it can help you choose between options: Suppose you want to see how your document looks in a different font or with different margins. Simply make the change, examine the results, then press <Ctrl>-Z to go back to the original. If you're still not sure, press <Ctrl>-Z again to go back to your new version. You can repeat this step until you make a decision.

***WordPerfect*, by the way, offers a way to restore any of the last three text deletions. In the DOS version, press <F1>, then P to toggle through them. When the text you want appears at the cursor, press R. In the *Windows* version, select Edit • Undelete or press <Alt>-<Shift>-<Backspace>, then select which deletion to restore.**

George Campbell, contributing editor

Can Speakers Damage Data?

Q Can magnetic fields from speakers damage or erase software?
Daniel R. Dampier, Oberlin, Ohio

A Since speaker cones contain electromagnets, it's a bad idea to store floppy disks or backup tapes alongside, under, or on top of a speaker. Not all speakers cause problems, but it's best to err on the side of prudence.

With soundboard-driven speakers becoming common PC accessories, I'll have to add them to my list of the common magnetic hazards that can damage floppy disks. As mentioned in October's column, the list includes magnets in paper-clip holders, copy stands, key chains, and charm bracelets, and electromagnets inside monitors, mechanical-bell telephones, electric pencil sharpeners, and AC/DC adapters. I wouldn't set my Walkman headphones on top of a disk, either.

640K of RAM Required?

Q I recently purchased a program that requires 640K of RAM, according to the manuals. No matter how I reconfigure DOS 5.0's memory management, I can't seem to free more than 609K. What should I do?
Patrick Chieh, Lagos, Nigeria

A No DOS application actually requires 640K of free conventional memory. The most free RAM DOS 5.0 can give you is 623K, and with earlier versions of DOS, you get even less. The worst RAM-hog programs I've seen use only about 500K of conventional memory. Programs with larger memory requirements, like *Paradox 4.0*, use DOS extenders (which usually conform to Microsoft's DOS Protected Mode Interface, or DPMI, standard) and require extended memory.

The confusion stems from the two different ways vendors state their applications' requirements. Some state RAM requirements in terms of the amount of memory their application uses, others in terms of the total memory that must be installed in the system. For example, the *Microsoft Word* box says, "384K available memory required," meaning there must be at least 384K free when you start the program (to check, type **MEM** or **CHKDSK** at the DOS prompt). In contrast, the *dBASE IV 1.5* box reads, "640K system required; *dBASE IV* and its applications will use 450K." This means that on a system with only 512K of RAM (the usual next step down from 640K), after you load DOS there won't be enough free memory to run *dBASE*.

Clearly your application's 640K RAM requirement refers to the total amount of RAM installed, not how much is free. If you have over 600K free and still can't run the program, the problem is something other than memory.

No Radiation Danger From Laptops

Q Is there any cancer-causing radiation danger from holding a laptop in your lap or sitting in an airplane seat next to someone using a laptop?
Hal W. Howes, McLean, Virginia

A You're thinking of the extremely low frequency (ELF) magnetic fields emitted by the flyback transformers in *desktop* monitors. Studies have shown that at certain frequencies and power levels, ELF magnetic fields have adverse effects on animals, and an Austra-

ILLUSTRATIONS: CRIS GALL

lian study found a correlation between use of computer monitors and brain tumors. A recent Finnish study found that women working at monitors with high ELF emissions suffered more miscarriages than women using monitors with low emissions, like those that conform to the Swedish MPR2 guidelines.

Monitor manufacturers generally deny that ELF emission is a problem, but they are nevertheless redesigning their monitors to reduce emissions. In any case, according to the New York–based ELF watchdog *VDT News*, the LCD screens used in laptops emit negligible amounts of ELF radiation and have no known adverse health effects.

Buy a Math Coprocessor?

Q I am considering adding a math coprocessor to my PC. Two programs I use a lot support a math coprocessor. Will other programs benefit from the addition, or do programs need to be coded to take advantage of it?
Mark Stewart, Allen, Texas

A Ignore those ads that claim a math coprocessor (also known as a floating-point unit, FPU, 287, or 387) will turbocharge all your software. Most applications don't do any floating-point math, so there's no reason for them to support an FPU. Even programs that use the FPU use it only for certain functions—the FPU doesn't speed up everything the program does (and yes, those functions were programmed to use the FPU). For example, spreadsheets use the FPU to speed up financial, statistical, and trigonometric functions, but the FPU doesn't make scrolling the sheet or recalcing other functions any faster.

Usually programs with functions that can get a significant speed boost from the FPU support it. Such programs include accounting, financial, statistical, and scientific math programs; CAD and other drawing-oriented graphics programs; relational databases; and PostScript interpreters.

Programs that generally do not benefit from math coprocessors are word processors (though *Word for Windows'* calculation and sort work faster with an FPU); desktop publishing, forms, paint, and presentation graphics programs; flat-file databases; communications software; and system software—DOS, *Windows*, utilities, and networks. Also, most scalable-font programs, including the two most popular—*Adobe Type Manager* and *Windows 3.1*'s built-in TrueType—do not use an FPU.

Note that the FPU is an add-on for 286 and 386 systems and built into the 486DX. For 486SX systems, the story is different: The 487SX "math coprocessor" is actually a 486DX with a special pinout. You install it in an "upgrade" socket, which disables the 486SX. However, to add an FPU to a 486SX system, you should install an OverDrive processor (which contains a built-in FPU) instead of the 487SX. The OverDrive speeds up system performance by an average 70 percent in addition to the gain its internal FPU delivers.

Distinguishing Disks

Q I buy 5¼-inch disks in bulk in both 360K and 1.2MB sizes. How can I tell them apart if they get mixed up? They all look the same.
Bob Mick, Chicago

A If the disk has no label or the label doesn't say DD (for double-density, 360K) or HD (for high-density, 1.2MB), look at the front side of the center of the disk. If there's a hub ring (reinforcing plastic, about ⅛ inch wide) around the large hole, it's probably a 360K disk; if there isn't a ring, it's probably a 1.2MB disk.

However, labels and rings aren't definitive. If you format what you think is a high-density disk to 1.2MB and end up with hundreds of thousands of bytes in bad sectors, you've most likely mixed them up. Reformat it to 360K with **FORMAT A: /F:360** (or **FORMAT A: /4** if you use DOS 3.*x* or earlier). If the disk then has no bad sectors, it's a normal double-density disk. If it still has tens of thou-

USER GROUP OF THE MONTH

Central Kentucky Computer Society

The February User Group Tips come from the Central Kentucky Computer Society, a multiplatform user group. In addition to operating an electronic bulletin board and publishing a monthly newsletter (with a technical support listing), the Central Kentucky Computer Society holds monthly meetings open to the public. Over a dozen special interest groups, including ones for databases, desktop publishing, fundamental DOS, *Windows*, and *WordPerfect*, meet at its resource center. A software library is available on line.

For more information about the Central Kentucky Computer Society, contact David Reed at 1300 New Circle Rd. #105, Lexington, KY 40505. Yearly memberships are $20 for individuals, $15 for students and seniors, and $30 for families.

Reader service no. 644

Saving Your Search Paths List: If something changes the extended directory-search paths list set by your AUTOEXEC.BAT's PATH command, how do you get it back? Do you reissue the PATH command? Do you reboot your computer? Rerun AUTOEXEC.BAT? Here's an easier way to reconstruct the search paths list:

In your AUTOEXEC.BAT file, immediately following its PATH command, add the command PATH > C:\SYSPATH.BAT on its own line. After the next time you boot your computer, if something accidentally modifies or destroys your search paths list, just enter C:\SYSPATH at the DOS prompt to restore it to normal.

Bob Brown
Central Kentucky Computer Society

sands of bytes in bad sectors, it's probably defective, so trash it.

Design Your Own Fonts

Q As a professional sign artist, I have collected books of fonts for years and have a sizable collection built up. I would like to be able to scan some of my favorites and put them in *CorelDraw 2.1* as regular fonts. Can you tell me how to do this? I see shareware and freeware fonts all over the place—how are these produced?
Mark Aaron, via PC World Online

A You could use CorelTrace to turn a scanned character into an outline, edit it in *CorelDraw*, and export it to a font file. (Look up WFNBOSS in the *CorelDraw* manuals for more information.) That process is pretty tedious, though. Most shareware, freeware, and commercial fonts are produced using special font-editing programs. Rather than starting from scratch, designers often start with a font that roughly matches the style they have in mind and edit it until they get the desired effect. Here are three *Windows* programs you can use to produce TrueType and PostScript fonts.

- **FontMonger** $149.95; Ares Software Corp.; 800/783-2737, 415/578-9090, 415/378-8999 (fax)
  Reader service no. 601
- **Fontographer for Windows** $495; Altsys Corp.; 214/680-2060, 214/680-0537 (fax)
  Reader service no. 602
- **Publisher's Type Foundry** $545; ZSoft Corp.; 800/444-4780, 404/428-0008, 404/427-1150 (fax)
  Reader service no. 603

QBasic Documentation

Q My computer came with QBasic installed as part of DOS 5.0, but I didn't get a manual for the program. Where can I get books or other reference materials that explain this tool?
Brian Evans, Osawatomie, Kansas

A The only QBasic documentation included with DOS 5.0 is the program's extensive on-line help. Supplementary written documentation is available from several publishers. Here are a few titles suitable for beginners. Any bookstore can order them using the ISBN listed.

- **QBasic By Example,** Greg Perry, $21.95 (Que, ISBN 0880228113)
- **QBasic Programming,** David Schneider and Peter Norton, $39.95 including disk (Prentice Hall, ISBN 0136587666)
- **Running MS-DOS QBasic,** Michael Halvorson and David Rygmyr, $22.95 (Microsoft Press, ISBN 1556153406)
- **Using QBasic,** Phil Feldman and Tom Rugg, $24.95 (Que, ISBN 0880227133)

Run Software From Drive B:

Q I have a 5¼-inch A: drive and a 3½-inch B: drive. I prefer to run my software off 3½-inch disks. I copied one of my programs from its 5¼-inch distribution disk to a 3½-inch work disk, but when I try to run the program it tells me to place the "master" disk in the A: drive. Is there a way to override this?
Brian Garrett, Cleveland, Georgia

A That depends on the program. Some programs are written so they'll run only from drive A:. Others will run from drive B: if you first enter **ASSIGN A=B** at the DOS prompt. When the program tries to read drive A:, ASSIGN steers it to drive B: instead. After you exit the program, enter **ASSIGN** to set drive A: back to normal.

If this trick doesn't work, your program is copy-protected. If you really want a 3½-inch version, contact the vendor, which should provide you with one for a nominal charge (but may insist you return the 5¼-inch master).

Reinstalling Copy-Protected Programs

Q I own *1-2-3* release 2.01. Thanks to a nasty series of hard disk problems, the copy-protection counter is now at zero, and I've been reduced to running the program from the distribution floppies. Is there some way I can get it running on my hard drive again?
Jason K. Douglas, York, Pennsylvania

A When disk problems prevent you from running copy-protected software, you should always be able to get new disks from the company for a nominal charge, or at least upgrade to a newer version of the program. If not, contact *PC World*'s *Consumer Watch* columnist. If the company goes out of business, you're out of luck—which is why copy-protection schemes that interfere with backups went out of style.

Luckily, Lotus is still in business. You have three options for getting *1-2-3* back on your hard disk. First, you can download R20SUP.EXE from CompuServe's LOTUSA forum. That file contains a utility that will remove the copy protection from your *2.01* distribution disks and allow you to reinstall it. If you don't have access to CompuServe, you can get the same utility from Lotus as part of the company's $15 *Value Pack for 1-2-3 2.01*. Or you can upgrade to *2.4* for $119 (if you want 3-D capability, consider upgrading to *3.1+* or *1-2-3 for Windows*).

- **Value Pack for 1-2-3 2.01** $15, 1-2-3 2.4 upgrade $119; Lotus Development Corp.; 800/343-5414, 617/577-8500
  Reader service no. 604

No-Battery Notebook Redux

In November's column, I told reader J. Nathaniel Marshall I hadn't seen a notebook that didn't require a battery even when plugged into AC power. Now I have: Advanced Scientific's 6.4-pound 25-MHz 386SXL's built-in power supply works fine without the battery. So if you work only where there is power, you can leave out the battery and reduce the weight to 5.8 pounds.

- **ASCO Notebook** with 2MB RAM and 60MB hard disk $1370, with 80MB hard disk $1450; Selcor Direct; 800/777-7058, 415/578-1165 (fax)
  Reader service no. 605

By Robert Lauriston

Robert Lauriston is a contributing editor for PC World.

Mail your questions to Help Line, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Help Line; CompuServe, 75300,3205; MCI Mail, 381-7106; Internet, rlauriston@aol.com; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

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You said it was perfect.

Introducing FaceLift™ 2.0 for WordPerfect®.

When we published FaceLift 1.5, users wrote to tell us that it was "the best font product" ever. Readers of WordPerfect Magazine voted it the winner of a Reader's Choice award.

Now we've made it even better.

FaceLift 2.0 is a faster, smarter version of 1.5. It does everything 1.5 did — from producing top-quality fonts from almost any printer to scaling fonts in almost any size — and much more.

With 2.0, laser printing is up to 50% faster than with 1.5. Plus there are new special effects, color printer support, new fonts and stronger network support.

If you're a WordPerfect 5.0/5.1 user who wants to print a wider variety of crisp, clean fonts and create special effects as well, FaceLift 2.0 is designed for you.

You can install FaceLift 2.0 quickly and easily. It'll use only a fraction of your hard disk space. And all you have to do is press Ctrl-F8, then 4 in WordPerfect to access all your fonts.

If you use FaceLift 1.5 now, you'll want to upgrade. If you haven't tried FaceLift yet, you're in for a real treat.

SCALE

Scale fonts instantly. In virtually any point size.

With FaceLift 2.0, you can scale fonts — including symbols and dingbats — instantly, in any size from 2 — 500 points. And still maintain top quality. Since Bitstream fonts are scalable outlines, not bitmaps, you'll get the clean, smooth look you want every time, in every size. In a flash.

You can create thousands of new styles.

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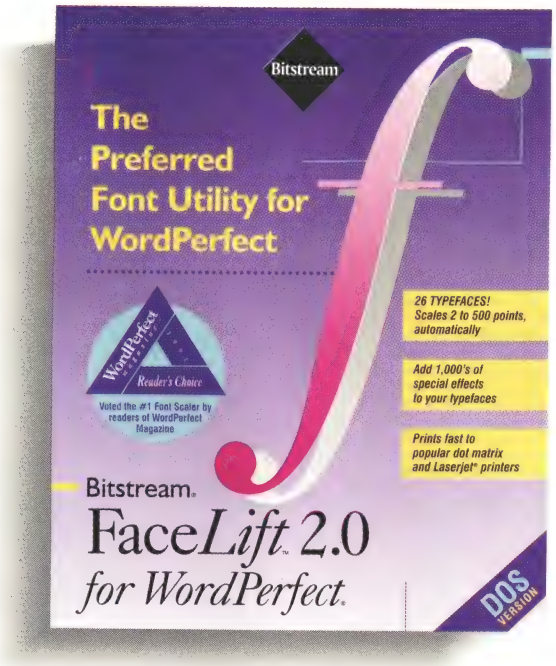

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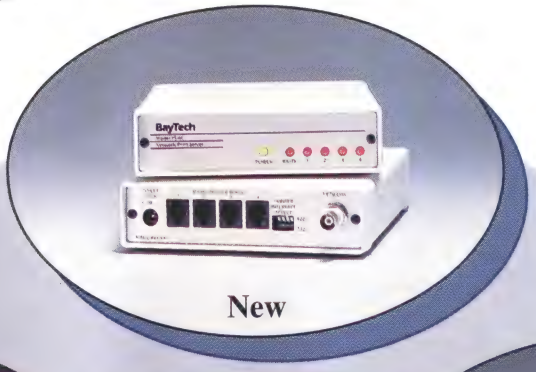

New

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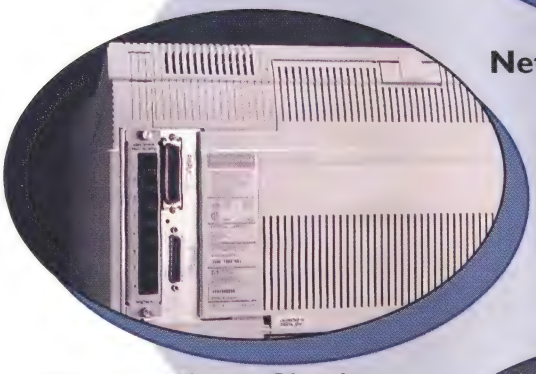
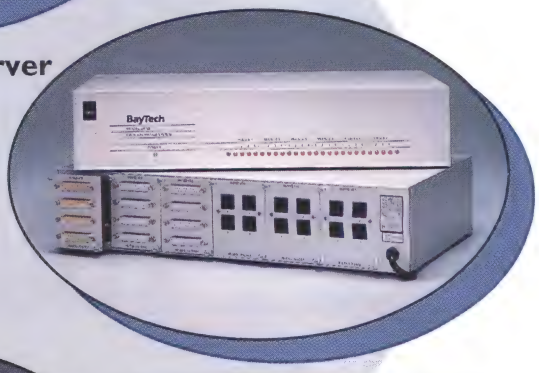


Plug-in Printer Sharing



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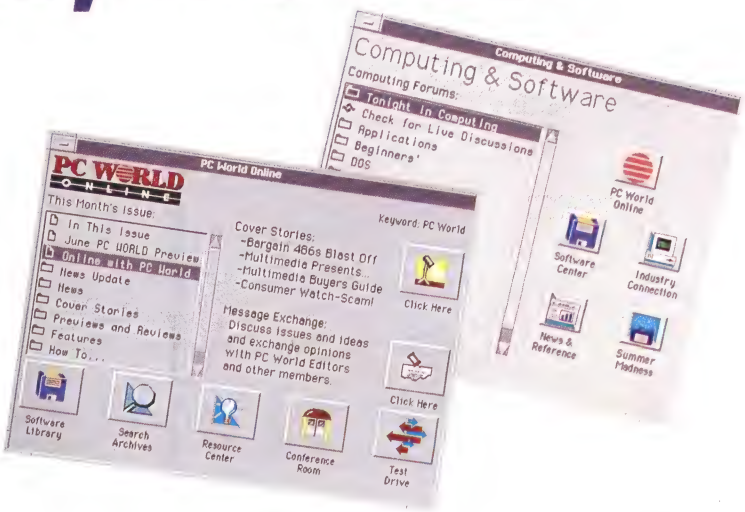

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SPREADSHEETS Q & A

Freak Protection in 1-2-3

Q We recently had a freak spreadsheet accident. A temporary worker professed to know how to use *1-2-3*, so we set him to entering data into a management report. Long after he was gone (and the report submitted), we discovered some of the answers were incorrect. Upon investigation, we realized that the temp had replaced some of the formulas with numbers!

What's the best way to guard against such errors?

William A. Horton, Dallas

A There are two general approaches: You can use data protection features the program provides, or you can provide visual cues to distinguish formulas and data. I'll illustrate the techniques with *1-2-3*, but you can use them in any popular spreadsheet program.

Data protection features use one command to mark data entry cells and another to prevent changes to unmarked cells. In *1-2-3*, use */Range•Unprotect* to mark all cells where data entry is allowed. Then, to protect the other cells in the worksheet, including your formulas, select */Worksheet•Global•Protection•Enable*. Once you've done this, you can enter or edit data only in the areas specifically marked as unprotected. Figure 1 shows what happens when you try to write in a protected cell.

The problem with global protection is that it prevents you from inserting or deleting rows and columns, and it's a hassle to turn it off and on when you want to edit the sheet. So unless you really need that degree of protection, you might go for visual cues instead.

As you might notice from Figure 1, unprotected cells appear in a different color. This color coding happens when you use the /Range•Unprotect command and doesn't require you to actually protect the rest of the worksheet. You can then simply tell your temporary employee to enter data only in the blue cells (the colors vary with different versions of *1-2-3*). In *Quattro Pro* or *Excel*, you can use colors, shading, or font changes to make the distinction.

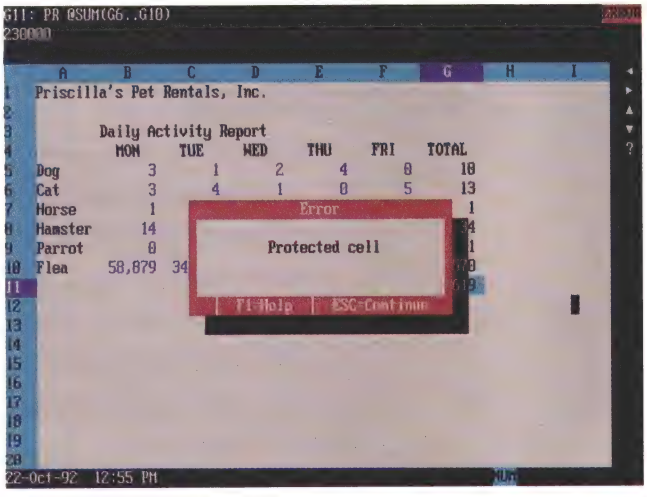

FIGURE 1: A PROTECTED WORKSHEET won't let you change anything in cells that you shouldn't be changing.

Incidentally, *Quattro Pro* for DOS 4.0 has a special command, Options•Protection•Formulas•Protect, that protects only formulas. For *Quattro Pro* users, this convenience may be the best solution.

Finding Zero in 1-2-3

Q I have a *1-2-3* macro that steps through a column of values, pausing on each cell that contains a zero so that I can enter a new data value. Here's a simplified version:

```
{IF @CELLPOINTER("contents")=0}{?}~
{down}{branch \N}
```

My problem is that the macro isn't able to recognize the difference between a cell that contains the number zero and a plain old empty cell—I don't want it to stop at the latter.

Bill Bliss, Detroit

A Try replacing the macro's first line with **{IF @CELLPOINTER("contents") = 0#and#@CELLPOINTER("type") = "v"}{?}~**.

@CELLPOINTER does return information about the current cell, but you're not getting enough information. A blank cell behaves like a zero in most calculations, and that's how @CELLPOINTER("contents") sees it. By adding @CELLPOINTER("type"), which returns a *v* if the current cell contains a number or formula, the macro finds only real zeros. Essentially, what this technique does is make your macro pause when the current cell is both a zero and a number.

No Calc in My 1-2-3, Thank You

Q Is there some way to prevent people from recalculating the formulas in a *1-2-3* worksheet, even if they press the recalc key (<F9>)?

Millie Metier, Leewater, Kentucky

A You might try the macro in Figure 2, which executes automatically when you retrieve the worksheet. To construct the macro, enter all the labels shown in an out-of-the-way spot in your worksheet, remembering to precede every label that starts with a slash (/ or \) with an apostrophe ('). Once you've entered them, put the cell pointer on A1, select */Range•Name•Labels•Right*, paint the range shown here as A1..A3, and press **<Enter>**. This macro will run automatically whenever you load the worksheet.

The statement in B1 executes the command /Worksheet•Global•Recalculation•Manual, which turns off the nor-

	A	B
1	\0	/wgrm{branch \0.1}
2	KEY	
3	\0.1	{get KEY}
4		{if KEY="{CALC}"}{branch \0.1}
5		{branch KEY}

FIGURE 2: DEACTIVATE THE RECALC KEY with this 1-2-3 macro.

Local Bus	X Ready	MPC Ready	Novell Ready	UNIX Ready	CAD Ready	Work Stations
80486DX2-66	80486DX2-66	80486SX-25	80486DX2-66	80486DX2-66	80486-33	80486DX2-50
VESA IDE	X Emulation	Upgradable	EISA Ethernet	16 Port EISA	VESA IDE	Ethernet
64K Cache	64K Cache	MPC Kit	64K Cache	64K Cache	64K Cache	64K Cache
4MB SIMM	4MB SIMM	4MB SIMM	16MB SIMM	32MB SIMM	8MB SIMM	4MB SIMM
120MB IDE	Ethernet	120MB IDE	660MB SCSI	1.2GB SCSI	120MB IDE	120MB IDE
1.2 & 1.44 Floppy	1.44 Floppy	1.2 & 1.44 Floppy	1.2 & 1.44 Floppy	1.2 & 1.44 Floppy	1.2 & 1.44 Floppy	1.44 Floppy
VESA VGA	VESA VGA	1MB VGA	256K VGA	256K VGA	VESA VGA	1MB VGA
14" NI VGA	17" NI VGA	14" NI VGA	14" Mono VGA	14" Mono VGA	20" NI VGA	14" NI VGA
101-Key KB	101-Key KB	101-Key KB	101-Key KB	101-Key KB	101-Key KB	101-Key KB
Mouse	Mouse	Mouse	Mouse	Mouse	Mouse	Mouse
DOS 5.0	DOS 5.0	DOS 5.0	DOS 5.0	DOS 5.0	DOS 5.0	DOS 5.0
Windows	Windows	Windows	Windows	Windows	Windows	Windows
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mal formula recalculation. The {GET} command in B3 pauses the macro until the user presses a key, whereupon it puts the keystroke into the cell named KEY, B2. When you press a key other than <F9>, its character or command replaces the label in that cell. B4 contains an {IF} statement that tests whether the last key pressed was <F9>. If not, it branches the macro back to B2 and then executes the key that the user just pressed. But if the user pressed <F9>, the macro branches to B4, thus bypassing the {CALC} keystroke.

Juggling Clients in Quattro Pro

Q I maintain a separate *Quattro Pro* worksheet file for each of my clients, with a series of standard data items in all of them. I'd like to create a separate report worksheet that would work for all of my clients, something that I can easily load a single client's data into. How can I set this up?
Norman Simon, Pulaski, Virginia

A You can easily set up your report so that typing a worksheet file name in a particular cell will bring you that sheet's data. Let's say that all your client worksheets have a range named DATA (that you created in each worksheet with the /Edit•Names•Create command). Let's also assume that one of your client files is named SMITH-.WQ1, and that these files are all stored in the \CLIENTS directory. In your report worksheet, enter the label **SMITH** into cell B1. In B2, enter the string formula **+"[\CLIENTS\"&B1&"]DATA"**. This will display the value [\CLIENTS\SMITH]DATA. Now in cell B3, enter the formula @SUM(@@(B2)); you'll get the total of values in SMITH.WQ1's DATA range. That's because the @@ function returns the label in B2—the range DATA in SMITH—as a range address. From now on when you enter a different file name in B1, you will get that file's DATA sum.

Sorting an Array in Excel

Q I'm using *Excel*'s Data•Table command to calculate payment alternatives for our sales proposals. I was delighted to find that *Excel*'s data table (unlike *1-2-3*'s) contains live formulas so you don't have to regenerate it when you change the input values. When I try to sort the table, however, I get an error message: 'Cannot change part of a table'. What am I doing wrong?
Juanita Perez
Sausalito, California

A If you put the cell pointer in your table and take a close look at the formula bar, you'll see telltale braces around the formulas: for example, {=TABLE(,C2)}. This tells you *Excel* created the table as what it calls an *array*, meaning the spreadsheet treats the range as a single unit. That means that you can't delete a portion of it, sort it, or otherwise break it apart.

There is a solution, but it comes at a price: To sort the table, you have to convert the array formula to ordinary numbers, which means you must regenerate it, as with *1-2-3*. If you'll pay that price, select the entire table and choose *Edit•Copy*. Then, without moving the cell pointer, select *Edit•Paste Special*, click *Values*, and press **<Enter>**. You now have a dumb but sortable table.

Excel Degree Format

Q I often need to place a degree symbol after a value in a cell in my *Excel* worksheets. I noticed that there is no degree format available under Format•Number. Can I build a custom format that will do this?
Kerry Dickinson, Ann Arbor, Michigan

A It's easy. Select the cells you want formatted, and choose *Format•Number*. (Or click the right mouse button on the selection and select *Number*.) Click the format category, and then click, but don't double-click, the format code closest to what you want. The format will appear in the Code window at the bottom of the dialog box. In that box, put the cursor at the end of the format text, hold down **<Alt>**, and on the numeric keypad type **0176** (ANSI code for the degree symbol). Release **<Alt>** and press **<Enter>**. Your format is ready.

By Richard Scoville

Richard Scoville is a contributing editor for PC World *and a software training consultant based in Chapel Hill, North Carolina.*

Mail your spreadsheet questions to Spreadsheets, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Spreadsheets; CompuServe, 72341,2727; MCI Mail, 357-4517; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

Spreadsheet Toolbox

Want to get information out of your PC, minicomputer, or (worse yet) mainframe database and into a *Windows* spreadsheet where you can use it? Have you found the database access features supplied with your spreadsheet to be incomprehensible or limited to a few database formats? Wouldn't it be nice if there was a universal, *Windows*-based "can opener" to open those database files, examine their data, select some records, and put them into your *Quattro Pro for Windows, Excel,* or *1-2-3/W* worksheet?

Look no further than the latest upgrade of Pioneer Software's *Q+E Database Editor*—a big improvement over the modest utility that comes bundled with *Excel*. For one thing, *Q+E 5.0* supports DB2, AS/400, *Ingress, Oracle, SQL Server, Paradox,* and *dBASE,* to mention a few of the big iron and PC database formats. It lets you open tables, join them, query the joined tables, sort the results, create calculated fields, and copy or link the output back into your spreadsheet. You can also group and summarize records, format and rearrange fields, set up data entry forms, and produce reports directly from *Q+E*.

Version 5 brings *Q+E*'s interface into the *Windows 3.1* point-and-click era, complete with the obligatory icon bar. There's also a *WinWord* template for mail merges and an add-in sheet for *Excel*. My only caveat: When you venture into complex queries, it's best if you're familiar with the basics of SQL syntax.

Q+E Database Editor 5.0 $299, upgrade from Excel Q+E $99; Pioneer Software; 919/859-2220

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Master Class: Calculated Queries in 1-2-3

Keeping formulas in a *1-2-3* database results in a slow, oversize, inflexible worksheet. What's more, when you extract data from such a database, the program copies any formulas as values into the output table.

For these reasons, you're better off keeping the formulas out of the data table and building them in the output range as they are needed. For a small subset of the data, you'll eliminate redundant formulas and give yourself a worksheet that is faster to save, retrieve, and recalculate. This month I'll show you a macro that adds a formula column to an output range.

The macro starts by doing a standard /Data • Query • Extract to an output range. After checking to make sure that at least one record was extracted, the macro makes a copy of a "seed" formula for each of the output records, producing an output table with an extra, calculated field.

	A	B	C	D
1	NAME	DEPT	SALARY	RAISE
2	Chaney, Lon	Mkt	25,000	5%
3	Chaplin, Charles	R&D	122,000	3%
4	Fairbanks, Doug	MIS	18,500	10%
5	Garbo, Greta	MIS	41,000	6%
6	Keaton, Buster	MIS	33,000	5%
7	Normand, Mabel	Sales	56,000	8%
8	Pickford, Mary	R&D	78,000	5%
9				
10				
11		DEPT		
12		R&D		
13			OUT_FORMULA	0
14			NEW TOTAL	207,560
15				
16	NAME	SALARY	RAISE	NEW SALARY
17	Chaplin, Charles	122,000	3%	125,660
18	Pickford, Mary	78,000	5%	81,900

TO SEE HOW A MACRO CAN EXTRACT DATA and add a calculated field, re-create this worksheet.

```
   H     I          J          K          L          M
1  \E  {break}
2      {blank OUT_DATA}
3      /dqeq
4      {if @COUNT(OUT_DATA)=0}{quit}
5      /rncOUT_DATA~{esc}.{up}{end}{right}.{end}{down}~
6      {goto}OUT_SALARY~
7      /rncOUT_SALARY~{bs}.{down @rows(OUT_DATA)-1}~
8      /cOUT_FORMULA~OUT_SALARY~
```

THIS MACRO ADDS A CALCULATED FIELD to a 1-2-3 data query. It belongs in the same file as the figure shown above.

To see the macro in action, re-create the sample personnel worksheet shown in the top figure at left (if you subscribe to PC World Online, you'll find the file in the Featured in February library). The database in this worksheet stores the department, salary, and planned raises for a group of individuals. The macro is set up to extract the names of everyone in a given department and calculate his or her new salary from the current salary and raise.

First, type in the database in A1..D8, the two labels in B11..B12, and the four titles in A16..D16. Then use */Data • Query* to define the query ranges as input range: A1..D8, criteria range: B11..B12, and output range: A16..D16.

As you can see, the entry in B12 is set to select the personnel in the R&D department. At this point, if you were to extract values from the database with /Data • Query • Extract, you would get, below row 16, the names, salaries, and raises for everyone in the R&D department.

Next, use */Range • Name • Create* to define these three range names: OUT_DATA for A17..D18, OUT_FORMULA for D13, OUT_SALARY for D17..D18.

What do these ranges do? OUT_DATA covers the data in the output table, plus the new salary formulas in column D. In addition to its role in the macro, OUT_DATA can be used to print the output records easily. OUT_FORMULA holds the seed formula that the macro copies to the output table, and OUT_SALARY is the place it gets copied to. The macro redefines both OUT_DATA and OUT_FORMULA to reflect the number of records that were extracted.

Now for a few formulas: First, type in the labels shown in C13..C14. In D13, OUT_FORMULA, enter the seed formula +B13*(1+C13). In D14, enter @SUM(OUT_SALARY). That second formula, which doesn't get copied, calculates the new salary total for the selected individuals. At the moment, that's the sum of D17..D18, but when the macro redefines the range name OUT_SALARY, the formula will adjust to sum that group. When you first create these formulas, their results will be zero—don't worry about it.

Now it's time to create the actual macro. Go to another part of your worksheet and enter the labels shown in the bottom figure at left, making sure to precede each label that begins with a slash (/ or \) with an apostrophe ('). When you're finished, place the cell pointer at the label \E and issue */Range • Name • Label • Right.* To run the macro, press <Alt>-E.

The macro begins by erasing the old output table, OUT_DATA. Then it extracts the records selected by the current criteria into the area below the output range. If no matching records are found, the macro halts; otherwise, it redefines OUT_DATA to include the full output table. Next, the macro redefines OUT_SALARY to match the current output (and resets the @SUM() function in D14 in the process); then it copies the seed formula into OUT_SALARY to calculate the new salaries. And now you've got a query result with a formula column.

WORD PROCESSING Q & A

Placeholder Boxes in WordPerfect 5.1

Q Is there an easy way to leave a blank area of a certain size in a *WordPerfect 5.1* document? I need to allow room for photographs of specific sizes to be pasted in later.
Mary Dean, Fairborn, Ohio

A This one's easy to answer. The trick is to use an empty *WordPerfect* user box as your placeholder. To avoid confusion and to make your placeholders visible, it's best to start with the text already in the document. Here are the steps you need to take:

1. Place the cursor on the page where you want the box, then press **<Alt>-<F9>UC**. You'll see the Definition: User Box menu.
2. Press **TA<Enter>** to anchor the box to the current page.
3. To set the box's vertical position, press **VS** and enter the desired distance from the top of the page in inches, then press **<Enter>**. Press **HS**, type in the horizontal position from the left edges of the page, and hit **<Enter>**.
4. To size the box, press **SB**, type a width measurement for the box, and press **<Enter>**. Then type a height measurement and press **<Enter>**.
5. Finally, press **WY<F7>** to set text wrapping and return to the editing screen.

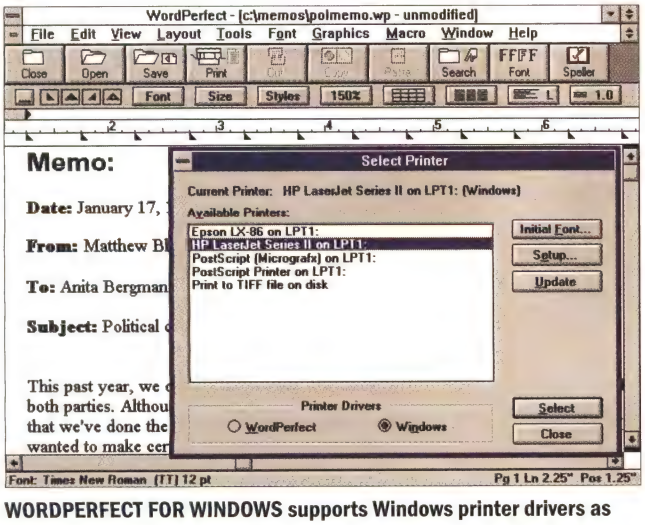
To see how the printed page will look, press **<Shift><F7>V**. You'll see a blank space on the page, with text wrapped around it, ready for the photographs you want to paste up.

Print Those WordPerfect Macros

Q I often create long macros in *WordPerfect 5.1 for DOS*, but I can't print the macro code. Is there any way to print the whole macro, other than using **<Shift>-<Print Screen>** repeatedly?
Dr. August Nechi
Stone Mountain, Georgia

A Every serious macro programmer needs to print listings, particularly of complex macros, but *WordPerfect* can't do it. Fortunately, shareware author David Seidman has an answer. Seidman's *MacroAid* is a set of utilities for *WordPerfect 5.x* for DOS macro gurus. One of them, *MACASCII*, converts macros to ASCII or *WordPerfect* files. Once converted, you can print the macros easily. Even better, you can edit a macro in *WordPerfect* or a text editor, then convert it back to a WPM file, bypassing *WordPerfect*'s limited macro editor altogether.

Other *MacroAid* utilities allow you to search and replace in macros, create cross-reference lists, and change macro types. *MacroAid*'s registration fee is $25. You can find the program, as **MACAID.ZIP**, in the "Featured in February" area on PC World Online or you can also find it on CompuServe's WordPerfect User Forum (GO WPUSER). Or request a copy of the program directly from David Seidman at, 2737 Devonshire Pl., NW, Washington, DC 20008.



WORDPERFECT FOR WINDOWS supports Windows printer drivers as well as native WordPerfect drivers. To use TrueType fonts, you'll have to open WordPerfect's Select Printer box and pick a Windows driver—otherwise, you won't have access to Windows' built-in fonts.

Missing WordPerfect for Windows Fonts

Q I like to garnish my pages with a variety of typefaces, so I purchased *Windows 3.1*, *WordPerfect for Windows*, and a collection of fonts. When I start *WordPerfect*, however, I don't see any of the TrueType fonts. I know they are there, because the fonts show up in *Windows* Write but I can't find them. Can you tell me what happened to all of my fonts?
Shelley Yomano, Gainesville, Florida

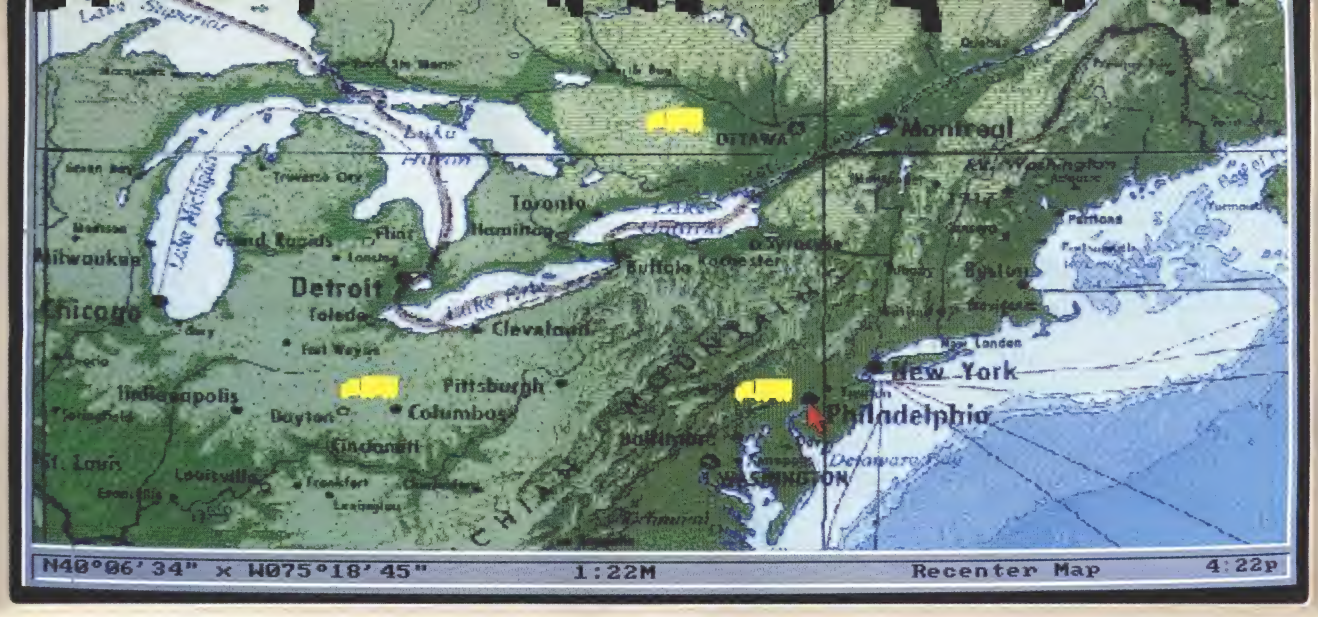
A The problem is not in *WordPerfect for Windows*, but in the way it was installed. During installation, you opted to install the program for your old *WordPerfect for DOS* printer drivers, which don't know anything about TrueType. But the fix is simple.

Start *WordPerfect for Windows*, then select *File•Select Printer*. In the dialog box, select *Windows*. In the Printer Drivers frame, highlight the *Windows* printer driver you want in the Available Printers list, then choose *Select*. *WordPerfect* will take a few moments to update its font list. You will then return to the editing screen with your *Windows* printer driver as the new default and all your TrueType fonts should be available for use.

If you see *only* TrueType fonts after doing this, and not your built-in printer fonts or other *Windows* fonts, you will need to do one additional thing. Exit *WordPerfect*, then fire up the Control Panel, and double-click the *Fonts* icon. In the dialog box, select *TrueType*, uncheck the Show Only TrueType Fonts in Applications box, then click *OK*. Finish the operation by selecting *Cancel*, then close the Control Panel.

Paging WinWord

Q I recently switched to *Word for Windows 2.0* and ran into a problem with page breaks. As I type my document, *Word for Windows* doesn't insert page breaks automatically. Can you offer any suggestions?
Blaine K. Masumoto, Honolulu



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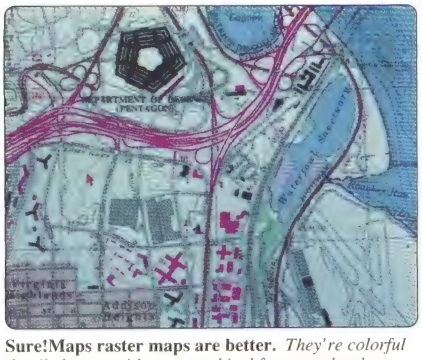
Standard SPOT CDs are available. If you want a particular scene or season you can order a custom SPOT CD as well.

The competition uses vector maps which feature simple lines and lack detail on points of interest and terrain.



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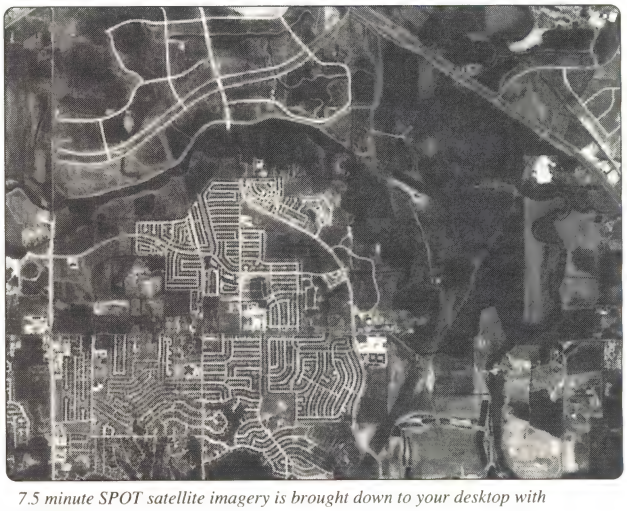

7.5 minute SPOT satellite imagery is brought down to your desktop with Sure!Maps.

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Sure!Maps makes it easy to incorporate your maps with other programs for presentation or desktop publishing. You can store an onscreen image in standard file formats (including TIFF, BMP, PCX, GIF and more) and import that file into other applications.

Hardware Requirements.

Sure!Maps runs on any industry-standard 80386 computer (or higher) with 4 MB of RAM, a CD-ROM drive, and SVGA or VGA display.

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A It sounds like you're working in *WinWord*'s Normal view, which displays your document as a continuous text stream. There are two quick solutions your Page Break dilemma. The easiest way to make *Word for Windows* display your document page by page is to select *View•Page Layout*, which paginates the file automatically.

If you prefer to edit in Normal view, you can still set up automatic pagination, but it's a touch trickier. Select *Tools•Options•General*. In the dialog box, select Background Repagination by clicking the check box or pressing **<Alt>-B**, then click *OK* to finish the job and set the option as the default. From then on, pagination will be automatic; you'll see a dotted line in Normal view to indicate page breaks.

In Search of a Universal File Format

Q An upcoming project calls for me to send out disks containing a large document. This file will be opened by various types of word processors, but must retain its fonts, layouts, and overall appearance. What's the best approach to this problem, and is there a universal word processor format?

Chester Peterson, Lindsborg, Kansas

A Sadly, there's no true universal word processor file format. You need to take another approach and ship more than one file type.

If some or all of your recipients use *Windows*, create the document in a *Windows* word processor and save it as a *Windows* Write WRI file. Even if some of your recipients don't have Write installed on their systems, they'll still be able to load the file into any other *Windows* word processor. For DOS users, send a *WordPerfect 5.1* file. With the notable exception of *Microsoft Word 5.0*, all major DOS and *Windows* word processors can import this format.

Then hedge your bets by sending a generic ASCII file, with carriage returns only at the ends of paragraphs. You'll lose your fonts and other formatting, but at least you're guaranteed that all users will be able to read the file. To save a file this way in *WordPerfect 5.1*, press **<Ctrl>-<F5>AG**, enter a file name, and press **<Enter>**. In the DOS or *Windows* version of *Microsoft Word*, you can save the file using the *Text Only* option.

Finally, for maximum compatibility, keep your document as simple as possible. Use common fonts such as Helvetica, Courier, and Times Roman. Avoid multiple columns and stick to boldfacing and italics for emphasis.

Custom Templates for Windows Write

Q I use my word processor for one thing: writing letters. And for that, *Windows 3.1*'s Write utility works just fine. The only thing I don't like about Write is that it always starts with the same settings, forcing me to change margins, fonts, and other defaults every time. Is there a way to force Write to start the way I want?

Bob Ward, Los Osos, California

A *Windows* Write is a surprisingly good little word processor for simple tasks like letter-writing, but there's no changing its fixed set of defaults. Still, there is a solution, and it's one that will work for any other *Windows* word processor.

Start by firing up Write, but don't load a document. Change your margins, fonts, and any other settings to suit your letter-writing style. You can even add boilerplate text, such as a signature line or a return address. Once you have things set up the way you want them, select *File•Save*, type a generic file name such as **LETTER**, then click *OK*. Now, exit Write.

Next, open *Windows'* File Manager in a partial window, with Program Manager visible beneath. Locate and select your LETTER.WRI file in its file window. Select *File•Properties* from File Manager's menu (or press **<Alt>-<Enter>**), check the Read Only attribute option, and select *OK*.

Now drag the highlighted file name with the mouse and drop it into an appropriate program group in Program Manager. A new Write icon will appear on your desktop with the name LETTER.WRI beneath it.

The next time you want to write a letter, double-click this new icon. Since *Windows* associates WRI files with the Write application, Write will start and load your LETTER.WRI file with all your layout and other choices intact. Now, here's the reason for that Read Only setting: When you try to save the new letter, Write will tell you that the file is write protected and will go to the Save As dialog box. Simply rename the file and you're finished.

The same trick works with all *Windows* programs, as long as the program has a file extension associated with it. You can create as many template files as you like, each with different settings, then turn them into icons for quick access from Program Manager.

By George Campbell

George Campbell is a contributing editor for PC World. *He can be reached on PC World Online (for more information, see page 8).*

Mail your word processing questions to Word Processing, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Word Processing; CompuServe, 71571,222; MCI Mail, GCAMPBELL; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

POWER TIP no. 271

Command Line Search

The following command line will search a group of like-named ASCII text files for any occurrence of a given string, then write the search results to a file: FOR %A IN *(filemask)* DO FIND /N '*searchtext*' %A *outfile*, where *filemask* defines what files to search (for instance, '*.*' for all the files in the directory), *searchtext* is the case-sensitive text you're looking for, and *outfile* is the file you want the search results to be placed in.

You can automate this process by creating a one-line batch file called SEARCH.BAT: FOR %%A IN (%1) DO FIND /N %2 %%A%3. When you use SEARCH, pass your parameters to it as SEARCH *filemask "searchtext" outfile*. Unfortunately, with the batch file, the search text can be only one word.

Paul Stackhouse
Lexington, Kentucky

WINDOWS Q & A

Swap Meet

Q I want to speed up *Windows* on my 386SX by adding a permanent swap file, but am unsure how big to make it. My computer has 2MB RAM and a fair amount of disk space. What's the optimum size for my system?
Drew Carson, Mesa, Arizona

A In your situation, the best way to speed things up is to buy more RAM—*Windows* crawls in 2MB, and too large a permanent swap file will make it worse. For now, create a small permanent swap file (2MB to 4MB), then increase the size gradually if you get out-of-memory messages.

To create your swap file, or to change its size, launch Control Panel from Program Manager's Main group, double-click on the 386 Enhanced icon, click *Virtual Memory*, and then click *Change*. In the resulting dialog box, accept *Windows'* recommended size or enter your own. If the size you enter is larger than the recommendation, *Windows* may not be able to use all of it. Once you've entered a size, click *OK* and follow the prompts to let *Windows* restart itself.

While permanent swap files are faster than temporary ones, all swap files slow down *Windows* when they're accessed. *Windows* puts running programs into a swap file when it needs more RAM than is physically available and must continually juggle programs between memory and disk. Since writing or reading from even the fastest hard disk takes time, swap files hurt, rather than help, performance. If you have only 2MB of real RAM and a very large swap file, your computer will spend a lot of time accessing the hard disk.

Windows bases its recommended size on a number of factors, including the PageOverCommit value in SYSTEM.INI (more on that later), how much RAM you have, and the amount of available, contiguous free disk space. The easiest way to increase the possible size of your permanent swap file is by increasing the PageOverCommit value in SYSTEM.INI. *Windows* multiplies this value by system RAM (rounded up to the nearest 4MB) as part of its calculations for swap file size.

To change this value, first make a backup copy of SYSTEM.INI in case anything goes wrong. In either File Manager or Program Manager, choose *File•Run*, type **SYSTEM.INI**, and then press **<Enter>** to open SYSTEM.INI in Notepad. Search for the section that begins with the heading '[386Enh]'. Under that line, add a line that reads **PageOverCommit=6**, replacing the 6 with any number between 1 and 20 for your new multiplier (the default is 4). Save the file and exit and restart *Windows*.

Avoid multipliers over 8. The higher the number, the less efficiently *Windows* navigates the inside of the file, and more hard disk activity slows down your system. Keeping your multiplier and swap file size low should get you by until you can increase your RAM.

Tile the File

Q I like to display multiple windows in File Manager. When I use the Window•Tile command, File Manager tiles my windows in horizontal rows, but I've seen other computers in my office with the windows tiled vertically. No one seems to know why. How can I make my windows tile vertically?
Tony Mondello, Dallas

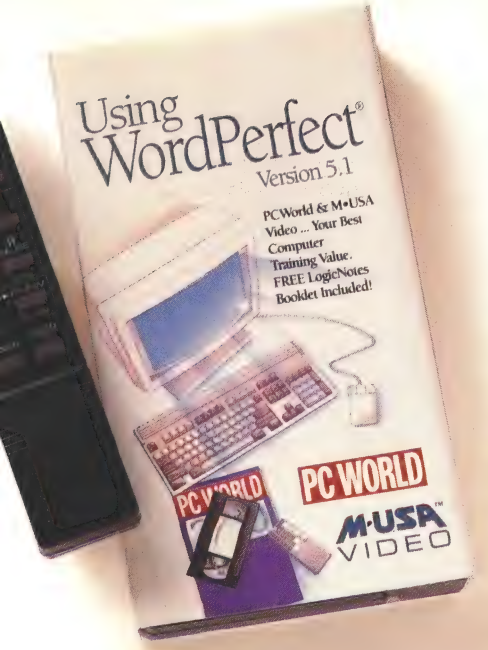
A By using the shortcut key instead of the menu. Keyboard shortcuts in *Windows* usually produce the same result as menu options, but this command is an exception. With two or three drive windows open in File Manager, choosing Window•Tile tiles the windows top to bottom. Pressing <Shift>-<F4> tiles them side by side.

Norton Garbage

Q I'm trying to teach my parents how to use *Windows*, and I purchased *Norton Desktop for Windows 2.0* to simplify their file management chores. One thing they haven't figured out is how to delete files. Can I put a Macintosh-like trash can on the desktop for them?
Sandeep S. Bhangoo, Richmond, Indiana

Windows Toolbox

It's cheap, it's hokey, but it's extremely practical. It's *WinLoad* from Thomas Software. This shareware DOS (gasp) program lets you add a line to your AUTOEXEC.BAT so you can choose whether to start *Windows* automatically when you turn on your computer. If you ignore the warning sound and flash (you can turn off the fireworks) for a specified number of seconds, *WinLoad* loads *Windows* (and yes, you can specify your favorite command line parameters). Or you can strike any key to stop *Windows* from loading when you need to work at the DOS prompt. *WinLoad* comes with a companion program that loads DOS programs conditionally in the same manner. Be nice and pay the $5 registration fee. Available on PC World Online and other online services (WINLOAD.ZIP), or from Thomas Software, 1375 Beasley Rd., Jackson, MS 39206.



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A You can use *Norton Desktop*'s SmartErase utility like a trash can and even make it look like one. If the SmartErase icon isn't already on the desktop, make sure the command **SMARTCAN /ON** is in your AUTOEXEC-.BAT file, and from the *Norton Desktop* menu, choose *Configure•Preferences* and check the SmartErase box. The SmartErase icon will appear on your screen. Click once on the SmartErase icon to open its pop-up menu (if no menu appears, choose *Configure•Preferences•Advanced* and check the Drive/Tool Icon Control Menu box), and select *Icon*. Now, from the Alternate Icon File drop-down list, select the file *c:\ndw\ndw.nil* (the path may be different depending on where you installed it). Scroll through the list of icons until you find and select a suitable trash can, and click *OK*.

Next, click the SmartErase icon again and choose *Label* from the pop-up menu. This dialog box lets you change the SmartErase icon label to **Trash** or whatever you like. Finally, choose *Configure•Save Configuration* from the main menu.

Your parents can now delete files by dragging selected file names to the trash can icon. To undelete files, they must double-click the icon and locate the deleted file in the directory where it originally existed. They can then select the file name and click *UnErase*.

Get a Grid On

Q I use Paintbrush to make technical black-and-white sketches. Is there a way to put a grid system on screen that will not print?

Thomas J. Keilman, Griffith, Indiana

A I know a few Paintbrush tricks that will not only help with your grid, but can prove useful for just about any Paintbrush job. Before I explain them though, I must say you're using the wrong tool for the job. You'll find a charting or drawing tool much more useful; some of them, like *Micrografx Draw*, can be bought for as little as $100. These programs, which understand the numbers behind the shapes, are much better suited to technical drawings than Paintbrush will ever be.

Getting back to Paintbrush, making the grid disappear before you print a file is easy, especially since your sketches are black and white. Simply draw the grid in a color other than black or white, and then change that color to white right before you print.

To avoid making the grid twice, save it immediately as **GRID.BMP**. To protect the file, select it in File Manager, press **<Alt>-<Enter>** to see its properties, check the Read Only box and click *OK*. You can then make the file easily launchable by dragging it from File Manager into the Program Manager group of your choice. It will place a new PaintBrush icon in Program Manager, with the name Grid; when you double-click this icon, *Windows* will load PaintBrush and GRID.BMP. But since GRID.BMP is read only, PaintBrush will only let you save the drawings you make over the grid with other names.

Now create your illustration using black or any color other than the one you used for the grid. When you're ready to print, save the picture in case you want to modify it later. Move the mouse to the color palette at the bottom of the window and click the grid color with the left mouse button to make it the foreground color. Click on white with the right mouse button to make it the background color. Double-click the Color Eraser tool (shown here). The grid will turn white and not print. Because this conversion affects only the viewable portion of your picture, you may need to scroll around and double-click the Color Eraser for every view of your page (alas, choosing Zoom Out from the View menu does no good).

If, after printing, you need the grid lines returned, simply reopen your file without saving the current changes.

By Scott Dunn

Scott Dunn is a contributing editor for PC World *and coauthor of* 101 Windows Tips *(Peachpit Press, Berkeley, California, 1992).*

Mail your questions to Windows, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Windows; CompuServe, 74055,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

USER GROUP TIP

Getting Out of DOS Boxes Easily in Windows

By default, *Windows* can't close a DOS application; you have to exit the program through its own menus or command system. There's a good reason for this: Because *Windows* has no control over the program, it can't save your data files and exit cleanly. But this extra step can be annoying—especially when you want to close all your programs and exit *Windows* in one clean sweep.

Luckily, a simple change to a DOS applications' program information file (PIF) can change this: From Program Manager's Main group, double-click on the PIF Editor icon and use *File • Open* to load the PIF file for the program you want to change. Press the *Advanced* button to go to the Advanced Options window. Once there, check the Allow Close When Active box.

You'll get a warning about the dangers of this practice. Is it real? That depends on your work habits and the program in question. If you save to disk regularly, and if the program recovers gracefully from crashes, the danger is minimal. I've never messed up anything on my disk that could be attributed to this practice.

Once you've clicked *OK* to close the warning box, click *OK* again to leave the Advanced Options window, then save the file and exit the PIF Editor. When you next load the DOS program, you'll be able to close it from the Control menu or the Task List, as well as exit *Windows* without quitting the program first.

Frank McGilligan
Central Kentucky Computer Society

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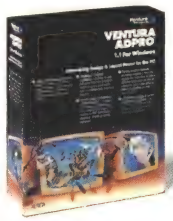

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Circle 243 on reader service card

DATA MANAGEMENT Q & A

Creating a dBASE III Plus Report Menu

Q I keep track of my customers with *dBASE III Plus*, and I have several reports that I need to print frequently. I'm not a programmer, but I'd like to create a simple menu for printing the reports so I don't have to go through the *dBASE* menus or deal with the dot prompt. I don't need anything fancy—just something that will let me print a report by pressing a keystroke or two—and I certainly don't want to hire a consultant. Can you advise me?
Tom Mitchinson, New York

A It's easy to write a simple program that will display a menu and print reports. Listing 1 gives you an example with three report choices, but you can revise it to include as many choices as will fit on your screen.

You can enter the program with any text editor or word processor that is able to create ASCII text files. Save it as **RPTMENU.PRG**. To use the editor that comes with *dBASE* (which isn't a very good one), type **MODIFY COMMAND rptmenu** at the dot prompt, and press **<Enter>**. When you're finished, press **<Ctrl>-<End>** to save your file and return to the dot prompt. Or you can download the file from the "Featured in February" folder on PC World Online.

As you type the commands, replace the names of your data files after the USE commands and your report names after the REPORT FROM commands. Also, use numbers (or letters) and report descriptions that mean something to you after each SAY command.

To use the menu program, issue the command **DO rptmenu** at the dot prompt. To print a report, type the appropriate number; to quit the program and return to the dot prompt, press **Q**.

Here's what the various commands do: The DO WHILE at the beginning and the ENDDO at the end set up a loop; everything between them is repeated until you break the cycle by quitting. The CLEAR command clears the screen to ready it for the menu, and the @..SAY's place strings of text on the screen. The two numbers after each @ sign tell *dBASE* where the text should begin on the screen (the first number is the row and the second is the column). The WAIT command waits for you to press a key, then stores that keystroke in a variable called rptnum.

The DO CASE...ENDCASE sequence tells *dBASE* what to do, depending on what's in rptnum. If you press one of the three numbers, it opens a file and prints a report. If you press *Q* (the AT() function makes *dBASE* accept either an upper or lowercase *Q*), *dBASE* runs the EXIT command, which breaks the DO WHILE loop and exits your program. Any other key will simply repaint the menu.
Shane Stevens, Chicago

```
DO WHILE .T.
 CLEAR
 @ 10,30 SAY "1 - Customer List"
 @ 12,30 SAY "2 - AR Report"
 @ 14,30 SAY "3 - Follow Up Report"
 @ 22,30 SAY "Enter report # or Q to quit"
 WAIT TO rptnum
 DO CASE
  CASE rptnum = "1"
   USE Customer
   REPORT FORM Customer TO PRINTER
  CASE rptnum = "2"
   USE Ar
   REPORT FORM ArReport TO PRINTER
  CASE rptnum = "3"
   USE Projects
   REPORT FORM FollowUp TO PRINTER
  CASE AT(rptnum,"Qq") > 0
   EXIT
 ENDCASE
ENDDO
```

LISTING 1: A SIMPLE DBASE PROGRAM that lets you print reports from a personalized menu.

Floating Dollar Signs in Paradox

Q I'm having trouble putting dollar signs in front of currency fields in a *Paradox* report. I know I can simply *type* a dollar sign in front of a field, but the result looks funny since all the dollar signs print in the same column, while the numbers they're supposed to be flush against, which align on the right, start in different places as their lengths vary. Is there a way I can make the dollar sign "float" with the value, no matter how wide the number is?
Franklin Tashlin, Kansas City, Kansas

A If you have *Paradox 3.5* or higher, you can use a calculated field to put a dollar sign right next to your currency field. Here's how to make the sign float:

From the *Paradox* Main menu, choose *Report•Change* and select the table and report you want to work with. Once you're in Report mode, use *Field•Erase* to remove the currency field in question from the report (you are going to replace it with something better). If you still have a dollar sign next to the field, delete it with standard editing keys. Then use *Field•Place•Calculated* to create a calculated field that includes an expression such as **FORMAT("E$,W10.2",[*Amount*])**, substituting the name of your currency field for *Amount*. Be sure to enclose the field name in square brackets. Follow the prompts to place the calculated field where the old field was. As you'll see when you use *Output•Screen*, you now have a dollar sign to the immediate left of each value in the field.

Here's how it works: The expression for this calculated field uses the PAL FORMAT() function. FORMAT(), which changes the way *Paradox* displays or prints values, needs two parameters: a string of one or more special formatting codes, and the value being formatted. In this example, the string of codes is *"E$,W10.2"*, and the value is the contents of your field.

The string is always enclosed in quotation marks (unless you want to get really tricky and use a variable), and the codes within the quoted string are separated by commas. Two formatting codes are used in the example: *E$* has *Paradox* show the value being printed with a

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floating dollar sign; *W10.2* says there can be up to ten characters printed, including two decimal places. If you need to print wider values, adjust the numbers accordingly—the first one must be big enough to include the decimal point and the decimal places.

The FORMAT function has additional uses, and it works in forms as well as reports. It can justify values, print leading zeros or signs, change the case of letters, vary date formats, and perform other magic with your data. See the PAL reference manual for a complete list of FORMAT codes.

Borrowing a Field in DataEase

Q I noticed *DataEase* comes with a predefined form called Dictionary. When I looked at it, I saw that it includes common fields like Social Security Number, already defined and ready to go. Can I use the Dictionary fields in my own forms to save time? I tried typing in the name of a Dictionary field after pressing <F10> to define a new field on a form, but that didn't work.

Sue Kingsley, Mountain View, California

A The *DataEase* Dictionary is there for you to copy field definitions from during form design. You can use the Dictionary fields as they are, modify them, or add your own standard fields to the dictionary.

To include a Dictionary field in one of your own forms, choose *Form Definition and Relationships* from the Main Menu. Then create a new form, or open one you've already designed. Once in the form designer, move the cursor to the place where you want the Dictionary field and press **<F5>**. When you're prompted for the type of object you want to copy, type **D** for a dictionary field. Then select the field you want from the resulting pop-up list.

Once you copy a field from the dictionary, you can change its characteristics by pressing **<F10>** while the cursor is in the field you want to change. Once you have made your changes, press **<F2>** to save them and return to the form design. These changes will affect only the field in the current form; the Dictionary will remain unaltered.

You can also place your own field definitions in the Dictionary. Just modify the Dictionary form and add fields as you would with any other form. Place the cursor in an empty place on the form, press **<F10>**, use the Field Definition dialog as needed, and save your new field with **<F2>**. Any field you add can then be copied to other forms by pressing <F5> during form design.

The *DataEase* Dictionary is a great time saver for adding groups of similar fields to forms. Instead of defining all the characteristics for each field, copy a Dictionary field and change it as needed for each new field.

By Celeste Robinson

Celeste Robinson is a PC World *contributing editor and the author of* The Paradox 4.0 Handbook *(Bantam Computer Books, New York, 1992).*

Mail your questions to Data Management, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Data Management; CompuServe, 74055,412; MCI Mail, 179-3813; or 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge unpublished materials.*

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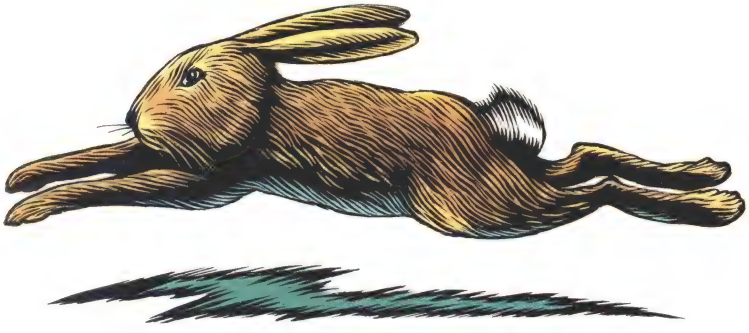

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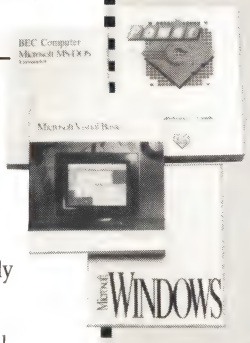

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PUBLISHING & PRESENTATIONS Q & A

Good-Looking Scans in PageMaker

Q I scanned a black-and-white logo for a brochure. Then, using *PageMaker*, I placed the scan on a page and reduced it to fit. For some reason though, the printed version looks distorted. What can I do to correct the problem?
Rajah Chacko, Apex, North Carolina

A The problem you describe is not unusual. The black-and-white dots that form scanned graphics often look off kilter after they've been *scaled* (reduced or enlarged). The way to avoid distortion is to maintain the image's original height-to-width proportions, also known as the *aspect ratio*.

For example, if you reduce a 4-by-6-inch graphic to fit a 3-by-3-inch space, you change the image's aspect ratio from 2:3 to 1:1—distorting it in the process. But if you reduce the graphic to fit a 2-by-3-inch space, you'll maintain the aspect ratio and get a smaller but otherwise exact duplicate.

Fortunately, *PageMaker* provides a built-in feature called "magic stretch" that maintains the aspect ratio as you scale an image. To use magic stretch:

1. Select the scanned graphic using the pointer tool, and point to one of its surrounding handles (the black squares at each corner).
2. Press **<Ctrl>-<Shift>** and hold down the left mouse button. The cursor will change into a double-headed arrow.
3. Drag the handle to scale the graphic, enlarging or reducing it, until the temporary outline surrounding the graphic is close to the size you want.
4. Release the mouse button and *PageMaker* will proportionally scale the graphic to the size you indicated.

You often find proportional scaling tools in other applications. For example, *Ventura Publisher* users can use *Frame•Sizing & Scaling* and select the *Aspect Ratio Maintained* option. Likewise, *Ami Pro* users can use *Frame•Graphics Scaling* and select the *Maintain aspect ratio* option.

PowerPoint Text Tricks

Q When I create presentation slides, I like to use *PowerPoint 3.0*'s shape tool to create objects and fill them with text. Then, whenever I move the object, the text moves along with it. Unfortunately, I can't always get the text inside an object to align the way I want. For example, I want to insert the words "New Sales Record" on three lines inside an arrow, with the first ("New") aligned left, the second ("Sales") centered, and the third ("Record") aligned right. But when I change the alignment for one line, the other two lines change as well. Is there any way to align each one individually?
May Sui, Menlo Park, California

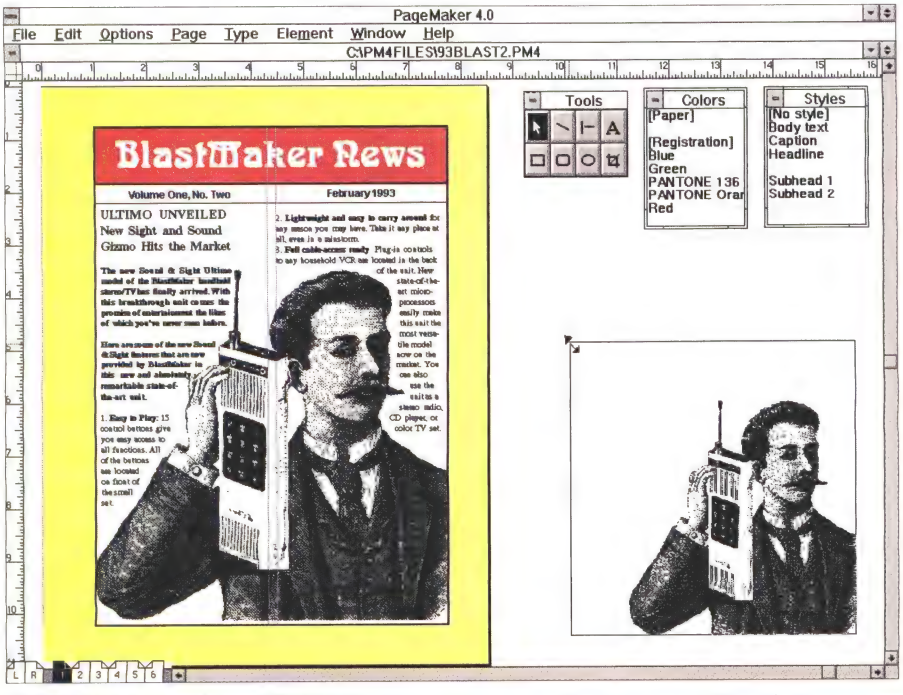
A Attaching text to an object is a nifty way to draw attention to key points in your charts. And there *is* a way to align text the way you want it. All you need to do is change one of the default settings that control how text fits inside objects. Try these steps:

1. Use the selection tool to select the object that contains the text you want to align—for example, the "New Sales Record" arrow.
2. Select *Text•Fit Text* to open the Fit Text dialog box, which provides several useful controls over the way the text is formatted in a selected object.
3. Check the Word-wrap Text in Object box. Unless this option box is checked, all paragraphs attached to an object have the same alignment.
4. Click *OK* to close the Fit Text dialog box.

Now you can select each separate paragraph (starting, for example, with "New") and use *Text•Alignment* to create the staircase effect you want.

DTP on the Cheap

Q We're using *PageMaker* on a Macintosh to put out a simple four-page newsletter, with mostly text and a few graphics, on a PostScript laser printer. We'd like to move the procedure to a PC using *Windows* and also continue to use some of our existing art, including a logo and some clip-art files. Is *PageMaker* our only choice?
Dean Carriveau, Spokane, Washington



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December 1992 PC Computing

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386SL/25	INTEL 80386SL–25 MHz, 64 K CPU CACHE ADVANCED SL POWER MGM'T.	AS ABOVE	80	3.5+	$1,499 $56/mo*
486SX/33	INTEL 80486SX–33 MHZ, BUILT-IN 8K CPU CACHE	4 STANDARD, 8 & 20 OPTIONS	80	2.5+	$1,999 $74/mo*
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486SX/33	INTEL 80486SX–33 MHz WITH BUILT-IN 8K CPU CACHE	4 STANDARD, 32 MAX	80	AS ABOVE	16 BIT SVGA CARD/ 14" 1024 X768 SVGA COLOR MONITOR	$1199 $44/mo*
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Circle 14 on reader service card

A While the *Windows* version of *PageMaker* can translate Mac files complete with formatting, it's not your only choice for publishing your newsletter on a PC.

In the past year, there's been a boom in competent low-end desktop publishing packages available to *Windows* users. Priced from $60 to $250, these packages require less disk space and RAM than their high-end cousins, and are generally easier to use. The list has grown to include *ExpressPage* (Carberry Technology, 508/970-5358), *Express Publisher* (Power Up, 800/851-2917), *Microsoft Publisher* (Microsoft, 800/227-4679), *PagePlus* (Serif, 603/889-8650), *PFS: Publisher for Windows* (Spinnaker, 800/323-8088), and *Publish It* (Timeworks, Inc., 800/323-7744).

As for transferring your Mac graphics files to the PC, stick with TIFF and EPS file formats, both of which are widely supported by PC and Mac applications. Finally, if you are unable to transfer the graphics files in your own office using a network, E-mail transfer, file translation program, or other method, have a service bureau do it for you.

Time-Stamping Ventura Documents

Q My office work group uses *Ventura Publisher 4.0* to produce training manuals and other documents for a bank, and we have to keep accurate track of each draft. The problem is, every so often someone forgets to change the date on a revised version. Is there a way to print the current date in a *Ventura* document automatically?

Gregory Cyzcyk, New York

A Yes, you can insert the date and the time in a *Ventura* document automatically, but only in headers and footers. For example, here's how to place the current date and time in a two-line footer at the bottom center of the right page:

1. Select *Chapter•Headers & Footers* or press **<Alt>CH** to open the Headers and Footers dialog box.
2. Check Define Right Page Footer and Usage On.
3. Move the text cursor to the first line opposite Center, and enter **[D]** (*Ventura*'s code for *date*).
4. Move the text cursor to the next line down, and enter **[H]** (for *time*).
5. Click *OK* to close the Headers and Footers box.

Ventura revises the date each time you open the chapter; the time, whenever you refresh the screen (for example, by pressing <Esc>) or print pages. To remove the date and time from the final document, delete the special codes in the footer.

By Richard Jantz

Contributing Editor Richard Jantz is a computer publishing consultant in Berkeley, California.

Mail your publishing and presentations questions to Publishing & Presentations, *Q&A*, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Publishing & Presentations; MCI Mail, RJANTZ; or 415/442-1891 (fax). Send make-over candidates, preferably clean and unfolded, to* Publishing & Presentations, *Make-Overs, at the above address.* PC World *pays $50 for published questions or make-overs. Sorry, we cannot acknowledge unpublished materials.* ■

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PC WORLD

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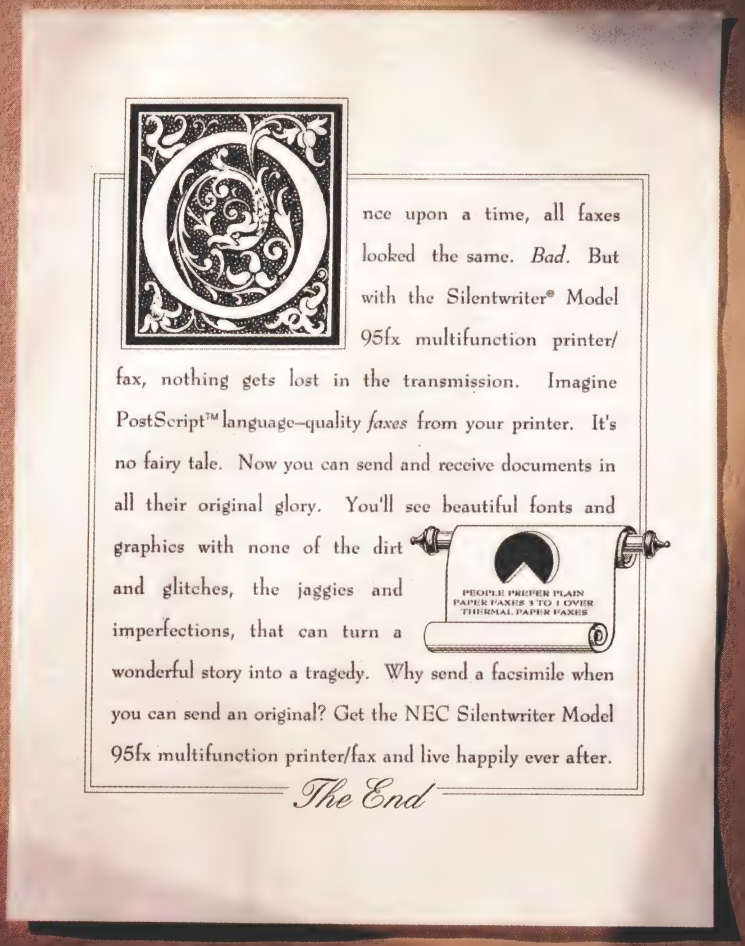

Once upon a time, all faxes looked the same. *Bad*. But with the Silentwriter® Model 95fx multifunction printer/fax, nothing gets lost in the transmission. Imagine PostScript™ language–quality *faxes* from your printer. It's no fairy tale. Now you can send and receive documents in all their original glory. You'll see beautiful fonts and graphics with none of the dirt and glitches, the jaggies and imperfections, that can turn a wonderful story into a tragedy. Why send a facsimile when you can send an original? Get the NEC Silentwriter Model 95fx multifunction printer/fax and live happily ever after.

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Circle 194 on reader service card

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Circle 171 on reader service card

COMMUNICATIONS Q & A

Of Modems and Phone Cards

Q I'm having problems setting up my communications program to dial long-distance calling card codes. I need to dial an 800-access number, the long-distance number, then the calling card ID number. I put the 800 number in a dialing prefix and the calling card number in a dialing suffix. This should work but doesn't. What am I doing wrong?
Steve Wilhite, The Colony, Texas

A You've done nothing wrong. You've simply stumbled upon the paradox underlying all modem communications: Things should work, but they don't.

Most modems won't accept command strings longer than 42 characters. Yours might lack the space for a calling card number and all the necessary pauses (commas). Or it may refuse to dial after the long-distance carrier answers because it doesn't hear a dial tone.

To cut down on the number of commas, increase the time the modem pauses when it encounters a comma in the dialing string. In the modem initialization string in your communication software's modem setup screen is a string that begins 'AT . . . '. Insert **S8=10** at the end of that string (before ^M).

You also need to get your modem to dial numbers without hearing a dial tone first, so it can enter the phone number and calling card access number. You can do this by changing the ATDT command, also in your communication software's setup screen, to **ATX1DT**.

I wrote a script that does all that and more. It's for *Procomm Plus*, but the scripting in your communications software is probably similar. Type the listing below into a text editor. In place of the *x*'s, add the appropriate phone numbers and long-distance access codes. If you dial 9 or 8 to access an outside line, add it before the 800 number. Be sure there are enough pauses (commas) between numbers to navigate your long-distance carrier. Save the script in text mode with an ASP extension. Compile with *Procomm*'s compiler by entering **aspcomp** *filename* at the DOS prompt in the *Procomm* directory.

To invoke the script with one keystroke, link it to a *Procomm* meta-key. Load *Procomm*, hit **<Alt>-M**, type **R** to select *Revise*, and use the cursor keys to toggle the file type to ASPECT. Then use **<Tab>** to get to *Contents*, type the file name without its extension, and save the settings. Now, to dial through your long-distance carrier, just load *Procomm* and hit the meta-key.

```
PROC MAIN
TRANSMIT "~~~+++~~~ATS8=10^M"
TRANSMIT "~~~+++~~~ATDT" ; Tell modem to prepare to dial
TRANSMIT "1800xxx-xxxx" ; Dial long-distance access number
TRANSMIT "," ; Wait 10 seconds
TRANSMIT "0xxx-xxx-xxxx" ; Dial the long-distance number
TRANSMIT "," ; Wait 10 seconds
TRANSMIT "xxxxxxxxxxxxxx" ; Enter calling card code
TRANSMIT "^M"
ENDPROC
```

DIAL YOUR ON-LINE SERVICE with your calling card and this program.

Catching Zs in XMODEM

Q An associate uses XMODEM to send *WordPerfect* files to other systems. The documents received have a number of ^Zs at the end. What are they? How can we get rid of them?
Clyde E. Brinegar, Meridian, Idaho

A When you use the XMODEM protocol to transmit a file, it breaks it into 128-byte blocks. Those ^Zs (<Ctrl>-Z, or ASCII 26, characters) at the end are the characters XMODEM adds to the last block in the file to pad its length to 128 bytes. You can delete them with your word processor or strip them with a utility that eliminates ^Zs or other high-bit characters. (There's one in the Featured in February folder on PC World Online. It's called STRIPERS.EXE.)

Even better, get your co-worker to switch to a more up-to-date error-correction protocol. Newer protocols don't need to pad the last block in the file, because at the start of the file transfer they send information on how large the transmitted file will be. Try YMODEM—an updated, faster version of XMODEM—or on clean phone lines, ZMODEM, which is even quicker.

By Judy Heim

Judy Heim is a contributing editor for PC World. *She can be reached on PC World Online. For more information, see page 8.*

Mail communications questions to Communications, PC World, *501 Second St. #600, San Francisco, CA 94107, or send them to PC World Online, Communications; CompuServe, 75300,713; Internet, 3127737@mcimail.com; MCI Mail, 312-7737; GEnie, JUDY.HEIM; 415/442-1891 (fax). We pay $50 for published questions. Sorry, we can't acknowledge unpublished materials.*

USER GROUP TIP

Multiple Procomm Log Names

When I log onto a BBS, I like to save what I see on screen to a file so I can read messages and file descriptions off line at my leisure. With *Procomm Plus*, press <Alt>-<F1><Enter> to start capturing text into a file called PCPLUS-.LOG. (To call it by another name, press <Alt>-<F1>, type the file name, and press <Enter>). To stop recording what's on screen, press <Alt>-<F1> again.

David Reed
Central Kentucky Computer Society

Paul McGuirk

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STAR-DOT-STAR TIPS

My Old Familiar Shell

DOS 5.0's DOSSHELL makes it easy to start, stop, and switch between applications. However, every time you exit DOSSHELL, it saves your current setup—the window arrangement, the screen colors, even the currently selected line in the program list. This means that the screen might look completely different every time you start DOSSHELL—hardly desirable if you're a creature of habit or you share your computer with co-workers.

Here's how to avoid the problem. First, create two batch files, SHELLSAV.BAT and DOSSHELL.BAT [Figure 1], in a directory that's in your AUTOEXEC.BAT's PATH statement. While running DOSSHELL, arrange everything according to the way you prefer it, then exit DOSSHELL and rename DOSSHELL.EXE (which you can find in your DOS directory) **DOSSHEL.EXE**.

Now run the command **SHELLSAV** from the DOS prompt. This will save a snapshot of the file DOSSHELL.INI, which your new DOSSHELL.BAT program can use. Now, when you type **DOSSHELL** at the DOS prompt, the shell will load with the saved configuration. If you wish to modify the standard configuration, simply set things up the way you prefer them and run SHELLSAV.BAT again.

Doug Sharp, New Orleans

Editor's note: This technique is a great way to avoid confusion on any machine that's used by more than one person—especially if those users are not highly computer literate. I modified Mr. Sharp's tip slightly so that users could simply type DOSSHELL in order to invoke the shell with the desired parameters.

```
SHELLSAV.BAT:
@COPY C:\DOS\DOSSHELL.INI C:\DOS\SHELLINI.SAV

DOSSHELL.BAT:
@ECHO OFF
REM  DOSSHELL.EXE must be renamed to DOSSHEL.EXE
COPY C:\DOS\SHELLINI.SAV C:\DOS\DOSSHELL.INI
DOSSHEL
```

FIGURE 1: ONCE YOU'VE RUN SHELLSAV.BAT, DOSSHELL.BAT runs DOSSHELL with your saved configuration.

```
     A      B      C      D      E
1  \C      /rnctemp~~
2          {goto}{?}~{Edit}{?}~{goto}temp~
3          /rndtemp~{quit}
```

FIGURE 2: THIS 1-2-3 MACRO lets you move to any named range or cell, enter data, and return to the cell where you started.

```
     A      B      C      D      F      G
1  \C      /rnctemp~~
2          {recalc \C_1}
3  \C_1    +"{goto}Z"&@STRING(@CELLPOINTER("row"),0)&"~"
4          {Edit}{?}~{goto}temp~
5          /rndtemp~{quit}
```

FIGURE 3: THIS VARIATION ON FIGURE 2 lets you write comments in a specified column of the current row.

A Comment Column for 1-2-3

I find it useful to keep a "comment" column at the far right in many of my *1-2-3* worksheets. As I enter and edit data, I often need to go to the comment cell for that row to explain the data. Splitting the screen isn't practical, because it doesn't leave enough room to show my longer comments. So I wrote a macro [Figure 2] that puts me in the comment cell for the current row and returns me to where I was after I hit <Enter>. The macro names the original cell "temp"; it then lets me enter a named range or cell to go to. After I have entered data in the comment cell, the macro returns me to the original cell and deletes the temporary range name.

Mark X. Saunders, San Diego

Editor's note: I made one small change to Mr. Saunders's macro: I inserted an {Edit} command so that when the macro stops at the comment cell, it will bring up the current comment rather than have you overwrite it.

I've also come up with a variation on the macro, shown in Figure 3. In my macro, the cell pointer moves to a specified column while staying in the current row. Use my macro if you're willing, for the sake of a few keystrokes, to keep all of your comments in the same column and always vertically aligned with what they're commenting on. Use Mr. Saunders's macro if you want a little more freedom.

Whichever macro you pick, enter it in an out-of-the-way place in your worksheet. Remember to precede every label that begins with a slash or backslash (/ or \) with an apostrophe. In other words, type in the first two cell entries as **'\C** and **'/rnc temp~~**. If you use the Figure 3 macro, note that the 'Z' in the formula in cell A3 tells *1-2-3* to use column Z for the comments; you may want to change that letter. When you type in that formula, don't despair when what you get on screen looks very different from what's shown here—it's supposed to.

Once you've entered a macro, use */Range•Name•Labels•Right* to assign the labels in the left-hand column to the cells to their right. This done, pressing <Alt>-C will run the macro. Both macros are available in COMMENTS-.WK1, in the Featured in February folder on PC World Online.

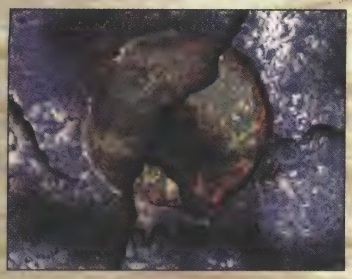
Ready Rolodex

I prefer to keep my personal Rolodex inside an ASCII text file I named ROLODEX.TXT, where each line

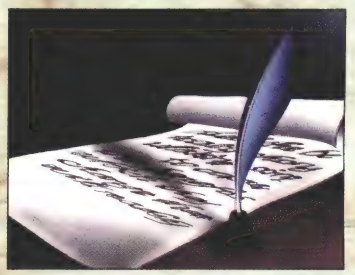
The Evolution of CAD

From the beginning of time, we have tried to express ourselves through graphics.

n the begin-
ning of time
people had
o use primi-
tive design
tools for
reating any
type of
graphics.



In the 15th Century design tools were quill ink pens and crude styles of paper.



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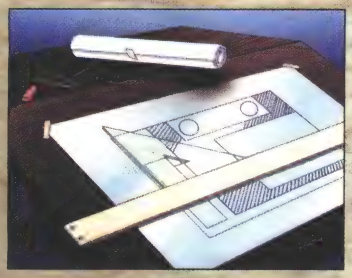
By the 18th Century we had advanced to the drafting table with T-squares, and the dreaded eraser.



In the 20th Century the first CAD programs were very slow and extremely difficult to use, not to mention the expense of buying them.

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contains a name and one or more phone numbers; for example:

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Deborah Smith	(312) 555-0887

I handle this list with a simple batch file, R.BAT [Figure 4]. If I invoke the batch file with no parameters, it loads my Rolodex file into the DOS 5.0 editor. However, if I enter a parameter, as in **R Bill**, R.BAT returns all the lines containing that string.

You can even set up *Windows* to run this batch file: Use PIFEDIT.EXE to create a new PIF file, specify **R.BAT** as the Program Filename, and place a question mark in the Optional Parameters field; the question mark tells *Windows* to prompt you for one or more parameters before starting the batch file. Make sure the 'Close Window on Exit' box is unchecked. Save your new PIF file as **R.PIF**, and drag it from File Manager to Program Manager to create a new program item. If you like, you can change the program's icon—I'd recommend the telephone that comes with Program Manager—by clicking on the current icon, pressing **<Alt>-<Enter>**, clicking *Change Icon*, and selecting the icon of your choice.

David April, Chicago

Editor's note: Don't forget to save R.BAT to a directory that's listed in your AUTOEXEC.BAT's PATH statement. And speaking of paths, don't use Figure 4 exactly as it appears; replace the **DIR**s with the path to your ROLODEX.TXT file.

Mr. April's batch file uses DOS 5.0's EDIT program to edit the Rolodex file. If you don't have DOS 5.0, or if you prefer another editor, change 'EDIT' in the second to the last line with your editor's executable file name. Also, note that the search string should not contain spaces, semicolons, or other characters that have special meaning on a DOS command line.

R.BAT is available in the Featured in February folder on PC World Online.

```
@ECHO OFF
IF "%1"=="" GOTO EDIT
ECHO.
C:\DOS\FIND "%1" /I C:\DIR\ROLODEX.TXT
ECHO.
GOTO END
:EDIT
C:\DOS\EDIT C:\DIR\ROLODEX.TXT
:END
```

FIGURE 4: THIS BATCH FILE, R.BAT, lets you search and maintain a simple electronic "Rolodex" file.

Bouncing Buffers to High Memory

In the DOS 5.0 manual, Microsoft recommends that you use the command BUFFERS=50 in your CONFIG.SYS file if you have a hard disk with a capacity of 120MB or more. What they *don't* say is that using 50 buffers when you're loading DOS high will significantly reduce the amount of lower memory available to run programs. On my own 486 system, BUFFERS=50 leaves me with 25K less of my precious low memory than BUFFERS=44.

The reason is that DOS allocates all of its buffers in one contiguous block of memory. If you tell DOS to load itself high, it tries to put the block in the high memory area (HMA), but there is only space in the HMA for 44 buffers! If you specify more, then *all* the buffers are allocated in low memory, and part of the high memory area is wasted.

The moral: If you're currently allocating more than 44 DOS buffers, try reducing the number. You might get an extra 25K or more low memory, and disk access won't slow down noticeably as a result.

Michael Hanson, Seattle

Editor's note: Mr. Hanson is correct: Using slightly fewer than 50 buffers will give you a good chunk of free conventional memory and won't slow disk access down significantly. But 44 may not be your magic number. At the *PC World* offices, we got one system up to 47 buffers with no ill effects. The moral: Experiment. If you're concerned about the impact of fewer buffers on your system, consider installing a cache such as *Super PC-Kwik*.

By the way, most third-party caches are far better than SmartDrive 3.0 (the cache that comes with MS-DOS 5.0) and will improve the performance of your disk dramatically.

Windows Detection Redux

In the September 1992 *Star-Dot-Star*, you offered a batch file that aborts itself when run from a *Windows* DOS session. By using such a batch file to enter *Windows 3.0*, you could avoid accidentally loading *Windows* from inside itself. Even in *Windows 3.1*, which protects users from making that mistake, this type of batch file can be a useful way to launch programs—like a defragger or low-level utility—that are dangerous to run inside *Windows*.

There's a problem with the technique described, however: It works by searching for a file that matches the pattern WIN?86-.SWP. But if the user has created a permanent swap file, there may not be a SWP file on the disk.

Here's a simpler way to tell if you're in *Windows:* In your batch file, insert the command **EXIT** before the program you don't want to run in *Windows*. For instance, if you might launch *Windows 3.0*, check with a batch file that contains the lines

```
EXIT
WIN
```

If you're in plain old DOS, the EXIT command will do nothing and the batch file will keep running. But if you are in a *Windows* DOS session, the EXIT command will terminate COMMAND.COM and will take you back to *Windows*.

Brian Deschene
Callander, Ontario, Canada

Editor's note: 'Tis true, alas: As several readers have reported, if you have created a large permanent swap file, or are running with no swap file at all, searching for WIN?86.SWP won't tell you if you're in *Windows* or not. Mr. Deschene's EXIT technique is more likely to succeed, because it will always terminate a "temporary" instance of COMMAND.COM (the kind *Windows* invokes) but not a "permanent" instance (the kind DOS sets up when you boot).

There are two caveats, however: First, if you run the batch file from a subsidiary shell—for instance, from an application program—the EXIT command will terminate the batch and the shell that's running it, returning you to the application. This isn't necessarily a bad thing, though; because *Windows* needs all the memory it can get, it's not a good idea to run it from a subsidiary shell. The second problem: Because the EXIT command ends the batch file, there's no way to print a message saying that the batch terminated because you were in *Windows*. The user may therefore

be mystified when the command just stops! The two batch files are available in the Featured in February folder on PC World Online.

Stealth Icons

If you'd rather not have other people know about some of the programs you're running from the *Windows* Program Manager, you can create an invisible "stealth" icon that doesn't show on screen. To other people, it's not there at all; only you know what double-clicking on that blank spot will do.

First, use an icon editor (such as the ones that come with *Norton Desktop for Windows*, *hDC Icon Designer*, or *Visual Basic*) to create an icon that's a solid block of the background color of your Program Manager windows. Then open the *Windows* Control Panel, double-click on the Colors icon, and set the color of the Active Title Bar to match the window background color. If this makes the Active Title Bar text disappear, choose a new, contrasting Active Title Bar Text color as well.

Now you're ready to prepare the icon. In Program Manager, click once on the icon you want to hide and press **<Alt>-<Enter>** to bring up the File Properties dialog box. Enter a single space character in the File Description field. Click the *Change Icon* button, and enter the path and file name of the icon you've just created as the File Name. When you're finished, the program's icon won't be visible, but you will still be able to invoke it by double-clicking on the right spot.

Daniel S. Rambles, Red Bud, Illinois

Editor's note: This is a clever way to hide a program's icon. However, if you use it in conjunction with Program Manager's auto-arrange feature, make sure your "stealth" icon is the last one in its group. Otherwise, the telltale gap will give it away.

Also, since giving the Active Title Bar and the window background the same color keeps Program Manager from highlighting the title of the focused icon, you may not want to make this change. Luckily, you don't have to. If you keep your old Active Title Bar color, the tip will still work, with one limitation: The icon will give itself away if it currently has the focus, either from someone clicking on it or moving to it with cursor keys.

One more suggestion: If you highlight the

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invisible icon and press **<Alt>-<Enter>**, you'll have the option of giving the icon a hot key. This can save you the hassle of stumbling around, looking for something you've hidden too well for your own use.

Untying NOTs in WordPerfect

Most programming languages have an IF NOT statement—that is, a way to execute a statement if a condition is false. *WordPerfect*'s macro/merge language doesn't have an obvious construct of this kind; however, you can create one by using the {IF} and {ELSE} statements in succession. For example, if you want to execute a statement only when the variable KChar does *not* have the value 32, you can write:

```
{IF}{VARIABLE}KChar~=32~
{ELSE}
{;} Put the statement here~
{END IF}
```

William J. Wolfe, Champaign, Illinois

Editor's note: If you don't use this trick, you might very well tie yourself up in "nots." It works because *WordPerfect*'s macro language allows a statement between an {IF} and an {ELSE} or {END IF}, but doesn't require one. Mr. Wolfe's technique essentially executes a null statement if the condition is met, and a different statement otherwise.

The macro in Figure 5, PERSPACE.WPM, demonstrates this technique while it checks a document for periods that aren't followed by two spaces. Since a period doesn't always end a sentence, the macro queries the user before adding a space. To create it, press **<Home>**, then **<Ctrl>-<F10>**. At the Define Macro prompt, type **perspace** and press **<Enter>**. At the Description prompt, type **Check for single spaces** and press **<Enter>** again. You're now ready to create the macro.

In the *WordPerfect* macro editor, you must insert different types of commands in different ways. To insert a command shown here in **boldface**, press **<Ctrl>-<Page Up>**, select the command from the pop-up list in the upper right corner of the screen, and press **<Enter>**. If a command is shown underlined, press the appropriate key (for example, **F7** for {Search}). For commands that are shown **boldface and underlined**, press **<Ctrl>-V**, then the appropriate key (for example, **<Ctrl>-V** then **<Enter>** for {Enter}). It's important, in this particular macro, to keep an eye out for blank spaces, which are shown in this listing—as they are in the macro editor itself—as dots. Type any other text as it appears. When you're finished entering the macro, press **<F7>**.

```
{ON NOT FOUND}{QUIT}~
{ASSIGN}Check~1~
{WHILE}{VARIABLE}Check~=1~
  {ASSIGN}Char~~
  {Search}.·{Search}
  {ASSIGN}KChar~{KTON}{SYSTEM}Right~~~
  {ASSIGN}SChar~{SYSTEM}Right~~
  {IF}  {VARIABLE}KChar~=32|
        {VARIABLE}KChar~=32778|
        {VARIABLE}KChar~=32781|
        {VARIABLE}KChar~=32780~
        {ELSE}{Left}{Left}
        {Block}{Right}{Right}
        {CHAR}Space~Insert·Space?·(Y/N)~
        {IF} "{VARIABLE}Space~"="Y"|
             "{VARIABLE}Space~"="y"~{Block}·
        {ELSE}{Block}
        {END IF}
  {END IF}
{END WHILE}
```

FIGURE 5: PERSPACE.WPM, WHICH SEARCHES for periods followed by single spaces, demonstrates IF NOT statements in WordPerfect's macro language.

You can run the macro by pressing **<Alt>-<F10>**, typing **perspace**, and pressing **<Enter>**. PERSPACE.WPM is available in the Featured in February folder on PC World Online.

By Brett Glass

Brett Glass is a contributing editor for PC World.

Have a macro, batch file, short program, or general tip you're proud of? Mail your tips to Star-Dot-Star, PC World, *501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Star-Dot-Star; Internet, rogue@well.sf.ca.us; MCI Mail, PC World Editorial, CompuServe, 74055,412; or 415/442-1891 (fax).* PC World *pays $25 to $200 for each tip used. Sorry, we cannot acknowledge unpublished materials.*

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PROCOMM PLUS 2.0 (DOS)

You invoke *Procomm Plus* commands primarily via <Alt>– or <Ctrl>–*key* combinations or by using the mouse and a pulldown menu. You can also automate commands with the program's meta keys and script language. Press **<Esc>** to exit menus.

The Terminal Mode screen is your main work space. All commands begin from this screen unless otherwise noted. The status line at its bottom shows the current terminal emulation, duplex mode, baud rate, and line settings, as well as log file, print, and on-line/off-line status. Keys to press are shown here in **boldface**. Keys to press simultaneously are joined by hyphens.

SETUP AND SUPPORT

These key combinations represent *Procomm Plus*'s housekeeping functions. They help you use other functions, set up the program, and automate tasks.

See function list and keystrokes	**<Alt>–Z**
Get help about Terminal Mode screen	**<Alt>–Z<Alt>–Z**
Get help about another screen	Go to screen, **<Alt>–Z**
Activate pulldown menu	**<Open Single Quote>** (')
Set seconds to wait for connection/pause between calls	**<Alt>–S**, **M**odem Options, **G**eneral Options, **A**/**B**, *number* (0 to 999), **<Enter>**
Set number of dialing attempts	**<Alt>–S**, **M**odem Options, **G**eneral Options, **G**, *number* (1 to 999), **<Enter>**
Set dialing command	**<Alt>–S**, **M**odem Options, **M**odem Commands, **B**, type command, **<Enter>**
Set connect/no-connect string	**<Alt>–S**, **M**odem Options, **R**esult Messages, *letter* (A to K), type message, **<Enter>**
Set default terminal emulation	**<Alt>–S**, **T**erminal Options, **A**, select emulation category, **<Enter>**, select emulation type, **<Enter>**
Set default duplex mode to half or full	**<Alt>–S**, **T**erminal Options, **B**, **<Space>** to toggle, **<Enter>**
Turn line wrap/screen scroll on or off	**<Alt>–S**, **T**erminal Options, **E**/**F**, **<Space>** to toggle, **<Enter>**
Set terminal screen width to 80 or 132 characters	**<Alt>–S**, **T**erminal Options, **L**, **<Space>** to toggle, **<Enter>**
Set display buffer size (in K)	**<Alt>–S**, **D**isplay/Sound Options, **H**, *number* (1 to 63), **<Enter>**
Set terminal/window colors	**<Alt>–S**, **C**olor Options, **T**erminal/**W**indow Colors, type feature's letter, **<Up>** or **<Down>** to select color, **<Enter>**
Set default baud rate	**<Alt>–P**, *number* (1 to 9)
Set default parity	**<Alt>–P**, *letter* (N, E, O, M, or S)
Set default data bits	**<Alt>–P**, **<Alt>–7** or **<Alt>–8**
Set default stop bits	**<Alt>–P**, **<Alt>–1** or **<Alt>–2**
Set default comm port	**<Alt>–P**, *function key* (<F1> to <F8>)
Save changes and exit port and line settings menu	**<Alt>–S**
Initialize modem	**<Alt>–J**
Reset terminal	**<Alt>–U**
Edit text	**<Alt>–A**
View clipboard	**<Alt>–<Equal Sign>** (=)
Enter host mode	**<Alt>–Q**

DIALING DIRECTORY

The dialing directory is your electronic phone book and supports 200 entries. Each entry holds the telephone number, the speed, the terminal emulation, the parity, and the number of data and stop bits of the modem you're calling. For all dialing directory commands, first open the directory using **<Alt>–D**.

Go to entry	**G**, type entry number
Find entry	**F**, type entry number
Go to adjacent entry	**<Up>** or **<Down>**
Go to beginning	**<Home>**
Go to last page	**<End>**
Go up/down ten entries	**<Page Up>**/**<Page Down>**
Create new entry	Go to blank entry, **S**
Make notes about entry	Go to entry, **J**, jot notes, **<F5>Y**
Revise entry	Go to entry, **R**. Change or don't change parameter, **<Enter>**; repeat for all parameters
Dial entry's phone number	Go to entry, **<Enter>**; or **D**, type entry number
Manual dial	**M**, type phone number
Print all entries	**L**
Sort entries by name	**S**

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WORKING ON LINE

Send file	**<Page Up>**, choose protocol, type path/file name, **<Enter>**
Receive file	**<Page Down>**, choose protocol, type path/file name, **<Enter>**
Enter Chat mode	**<Alt>–O**
Enter Host mode	**<Alt>–Q**
Toggle auto-answer on/off	**<Alt>–Y**
Pause/resume scrolling	**<Alt>–N**
Go to DOS shell	**<Alt>–<F4>**
Return from DOS shell	**EXIT<Enter>** at DOS prompt
Show file directory	**<Alt>–F**
Change current directory	**<Alt>–<F7>**
View file	**<Alt>–V**, type path/file name
Turn logging to file on/off	**<Alt>–<F1>**, type log file name
Pause/resume logging	**<Alt>–<F2>**
Send break	**<Alt>–B**
Toggle duplex mode	**<Alt>–E**
Toggle line feeds	**<Alt>–<F3>**
Toggle record mode	**<Alt>–R**
Enter Monitor mode	**<Ctrl>–<Backslash>**
Take screen shot	**<Alt>–G**
Redisplay text	**<Alt>–<F6>**, **<Up>** or **<Page Up>**
Hang up	**<Alt>–H**
Quit *Procomm Plus*	**<Alt>–X**

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PROCOMM PLUS FOR WINDOWS

All commands begin at the Terminal window unless otherwise indicated. Use **<Ctrl>–<Tab>** or a mouse click to switch between Terminal, Setup, and Directory windows. Keys to press are shown here in **boldface**. Keys to press simultaneously are joined by hyphens. A bullet (•) separates menu, option, and button names.

THE ACTION BAR

Use Action Bar buttons and drop-down list boxes to invoke commands. The number of buttons *Procomm* shows depends on the resolution of your screen.

Button/list box	Task	Keyboard
	Open/close default dialing directory	**<Alt>–D**
Rapid Dial: Compuserve	Dial entry shown or entry in list	**<Alt>–R**, select entry if necessary, **<Enter>**
	Run script shown	**<Alt>–<Period> <Enter>**
Script File: mci	Run script in list	**<Alt>–T**, select script, **<Enter>**
	Open/close Setup window	**<Alt>–S**
	Review/continue session	**<Alt>–P**
	Open/close File Clipboard	**<Alt>–<Equal Sign>** (=)
	Open Send File dialog box	**File • Send File**
	Open Receive File dialog box	**File • Receive File**
	Open/close Capture File	**<Alt>–<F1>**
	Start/stop print logging	**<Alt>–N**
	Hang up	**<Alt>–<F2>**

SETUP AND SUPPORT

Open Help contents	**<Alt>–Z** or **Help • Contents**
Get context-sensitive help	Select item, **<F1>**
Set colors	**Window • Custom Colors**, select screen element, select color, **OK**
Initialize modem	**<Alt>–J** or **Communication • Initialize Modem**
Reset terminal	**<Alt>–U** or **Edit • Reset Terminal**

The Setup Window

Use **<Alt>–S**, Action Bar's *Setup* button, or **Window • Setup** to open and close the Setup window. You can also use **<Alt>–<F4>** or **File • Exit** to close it.

Set connect/no-connect string	**Connection**, select modem, **Advanced! • Modem Setup**, select string, type string, **OK • OK**
Set default terminal emulation	**Terminal**, select emulation
Set default duplex mode	**Port settings • Duplex**, select mode, **OK**
Turn line wrap/screen scroll on or off	**Terminal**, select emulation, **Advanced! • Line wrap/Screen scroll • OK**
Set default protocol	**Protocol**, select protocol

SETUP AND SUPPORT (continued)

Set default baud rate	**Baud rate**, select baud rate
Set default parity	**Port settings, Parity**, select choice, **OK**
Set default data bits	**Port settings, Data**, select *7* or *8*, **OK**
Set default stop bits	**Port settings, Stop**, select *1* or *2*, **OK**
Set default comm port	**Connection • Advanced!**, select modem, **Port**, select port, **OK • OK**

DIALING DIRECTORIES

Use **<Alt>–D**, Action Bar's *Directory* button, or **Window • Dialing Directory** to open and close the default dialing directory. Or use **<Alt>–<F4>** or **File • Exit** to close it. For all but the first two tasks below, open a Directory window first.

Open another directory	**File • Open Dialing Directory**, select directory, **OK**
Create directory	**File • Create Dialing Directory**. In Directory window: **File • Save As**, type name, **OK**
Add entry	**Edit • Add New Entry**
Go to entry	Click entry number; find entry; or use cursor keys
Find entry	**Edit • Find**, type name, **Find**
Dial entry	Double-click entry number; or go to entry, **<Enter>**
Manual dial	**Manual Dial**, type phone number, **OK**
Revise field in entry	Cursor to field, **<Space>**; or double-click field
Delete entry	Go to entry, **Edit • Delete Entry**
Sort entries	**<Ctrl>–S** or **Edit • Sort**
Print entries	**<Ctrl>–L** or **File • Print**
Set seconds to wait for connection	**Dial • Options** • *number* (5 to 99) • **OK**
Set number of connection attempts	**Dial • Options • Make** • *number* (0 to 999) • **OK**
Set seconds to pause between attempts	**Dial • Options • Wait** • *number* (0 to 99) • **OK**

WORKING ON LINE

Send file	**File • Send File**, type or select file name, **OK**
Send character	Double-click character in Terminal window
Receive file	**File • Receive File**, select file name, **OK**
Enter Chat mode	**<Alt>–O** or **Window • Chat**
Enter Host mode	**<Alt>–2** or Host meta button
Auto-answer on/off	**<Alt>–Y/<Alt>–Q**; or **Communication • Auto Answer On/Off**
Start/stop recorder	**<Alt>–<Right Bracket>** (]) or **Scripts • Start/Stop Recorder**
Shell to DOS	**<Alt>–1** or DOS meta button
Return from shell	**EXIT<Enter>** at DOS prompt
Send break	**<Alt>–B** or **Communication • Break**
Clear screen	**<Alt>–C** or **Edit • Clear Screen**
Start/stop print logging	**<Alt>–N**; Action Bar button; or **File • Print Capture**
Review/continue session	**<Alt>–P** or **Edit • Scrollback/Pause**
Hang up	**<Alt>–<F2>** or **Communication • Hang Up**
Quit *Procomm Plus*	**<Alt>–X**; **<Alt>–<F4>**; or **File • Exit**

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First name

Last name

Daytime phone number

1	○	○	○		○	○	○		○	○	○	○
2	○	○	○		○	○	○		○	○	○	○
3	○	○	○		○	○	○		○	○	○	○
4	○	○	○		○	○	○		○	○	○	○
5	○	○	○		○	○	○		○	○	○	○
6	○	○	○		○	○	○		○	○	○	○
7	○	○	○		○	○	○		○	○	○	○
8	○	○	○		○	○	○		○	○	○	○
9	○	○	○		○	○	○		○	○	○	○
0	○	○	○		○	○	○		○	○	○	○

	Did you read it?		Value to you? (Least 1 – Most 5)				
	All	Some	1	2	3	4	5
Sample	◉	○	○	○	○	○	◉
In This Issue (page 13)	○	○	○	○	○	○	○
Letters (page 17)	○	○	○	○	○	○	○
Consumer Watch (page 29)	○	○	○	○	○	○	○
Real Problems, Real Solutions (page 45)	○	○	○	○	○	○	○
What's Next (page 59)	○	○	○	○	○	○	○
Top of the News (pages 62-74)	○	○	○	○	○	○	○
Dell's Performance Explosion (page 62)	○	○	○	○	○	○	○
Apple's Cross-Platform Printing (page 64)	○	○	○	○	○	○	○
Windows Printing System (page 66)	○	○	○	○	○	○	○
Intel's Pentium Processor (page 67)	○	○	○	○	○	○	○
VL-Bus Boards (page 70)	○	○	○	○	○	○	○
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New Products (page 83)	○	○	○	○	○	○	○
Marketplace (page 111)	○	○	○	○	○	○	○
25 New 486s: Quest for the Best PC (page 116)	○	○	○	○	○	○	○
Are Upgrades Worth It? (page 152)	○	○	○	○	○	○	○

	Did you read it?		Value to you? (Least 1 – Most 5)				
	All	Some	1	2	3	4	5
Windows for Workgroups (page 159)	○	○	○	○	○	○	○
OS/2 vs. Windows NT (page 167)	○	○	○	○	○	○	○
75 Hot Word Processing Tips (page 178)	○	○	○	○	○	○	○
Windows Fax Software (page 210)	○	○	○	○	○	○	○
Help Line (page 224)	○	○	○	○	○	○	○
Spreadsheets (page 234)	○	○	○	○	○	○	○
Word Processing (page 238)	○	○	○	○	○	○	○
Windows (page 242)	○	○	○	○	○	○	○
Data Management (page 246)	○	○	○	○	○	○	○
Publishing & Presentations (page 252)	○	○	○	○	○	○	○
Communications (page 260)	○	○	○	○	○	○	○
Star-Dot-Star (page 262)	○	○	○	○	○	○	○
Instant Reference Card: Procomm (page 267)	○	○	○	○	○	○	○
Business Fixtures (page 303)	○	○	○	○	○	○	○
Managers of the Universe (page 307)	○	○	○	○	○	○	○
Home Office (page 310)	○	○	○	○	○	○	○
HOW WOULD YOU RATE THIS ISSUE OVERALL?			○	○	○	○	○

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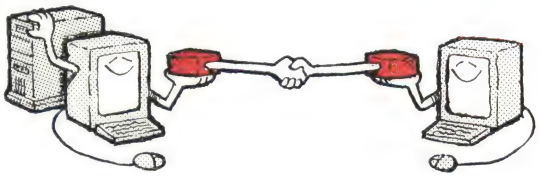

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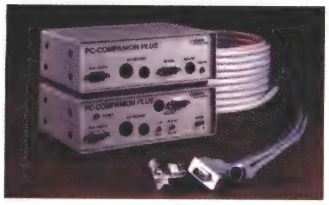

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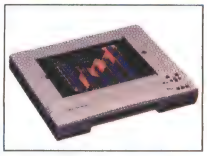

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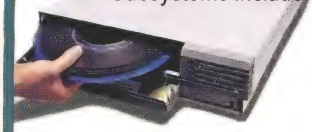

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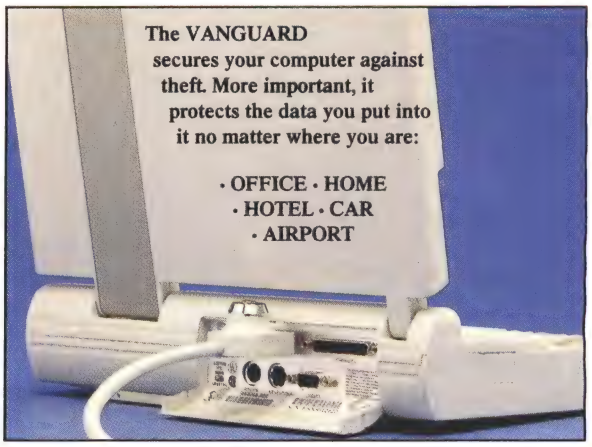

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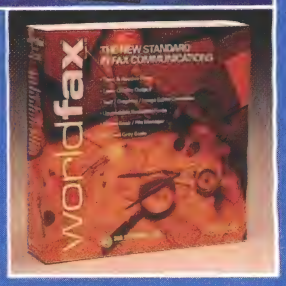

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FACT: *56% of PC WORLD subscribers reported making purchases ("immediately" or "very soon") after seeing an ad in the magazine.*

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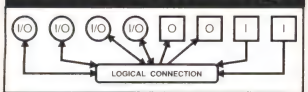

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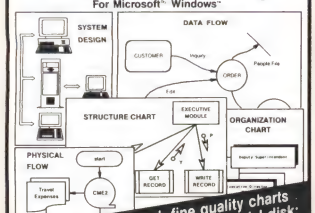

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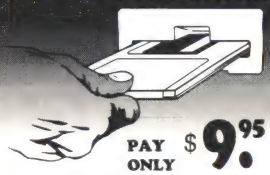

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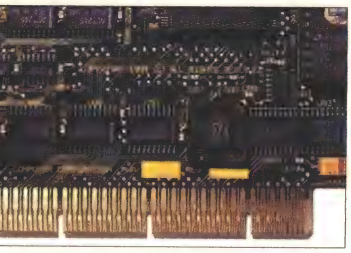

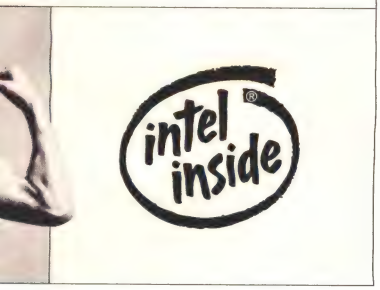

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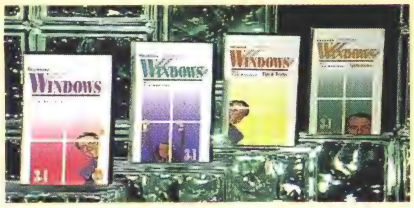

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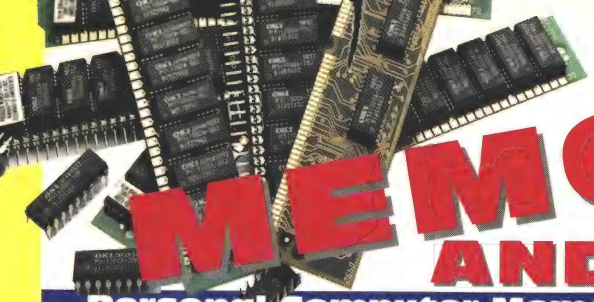

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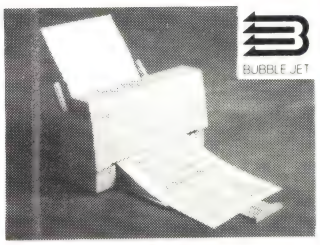

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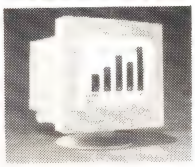

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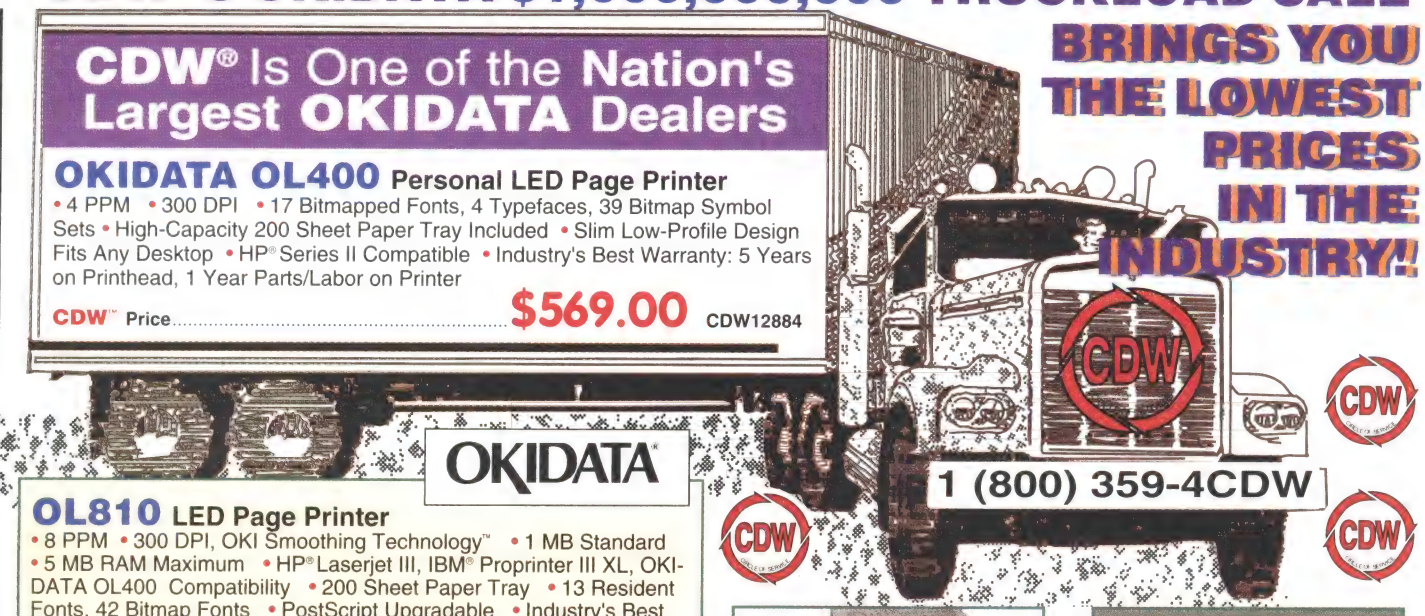

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The Power and the Personal

It was Saturday, and the UPS truck had been gone less than an hour, but the new arrival—a 66-MHz 486DX2—was already in operation and attached to my *LANtastic* network. That's how eager I was.

The MIS system was joining several other "power" products: a budget-minded Compaq ProLinea 4/50 and a super-smart QMS 860 printer, newly arrived for my monthly *PC World* hands-on roundup review. To top things off, I had one piece of software to put to use, *Lotus Organizer 1.0*.

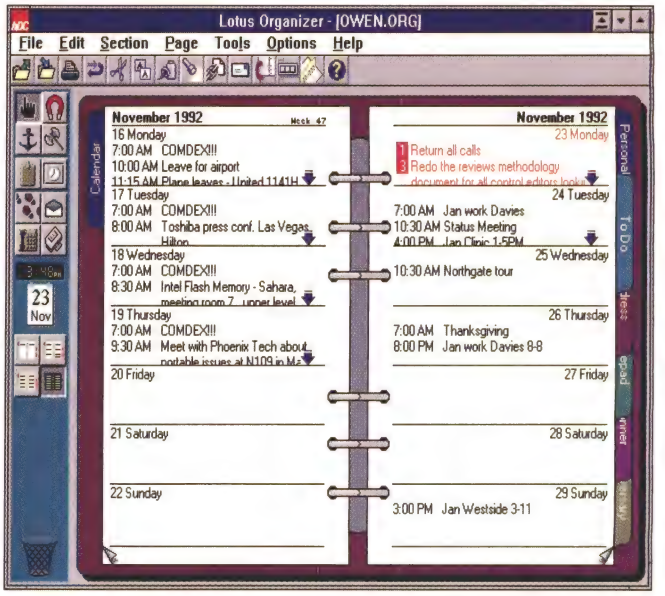
As I stuffed ethernet and modem cards into the MIS machine, many questions raced through my head, all boiling down to one key question: Would I "feel" the difference? Mind you, 486 power is not new to my office. My daily work machine is a Cheetah Gold 425—a 25-MHz platform—once the hottest performer on the market.

MIS (MicroNiche Information Systems) is not a brand-name clone builder but more an assembler. The firm takes the broad specifications of a client and assembles off-the-shelf products into a complete system. Although MIS will assemble a machine for any single user, its big business has been with Fortune 1000 companies, the Pentagon, and NASA.

My broad specifications had called for a "power" system. What I received were two shipping boxes; one with a Morse 17-inch 1280-by-1024-capable monitor, the other containing a roomy 24-by-8.5-by-17-inch tower chassis and a Maxiswitch 124 Pro keyboard. A $4195 package.

The power was inside the tower, of course—a Micronics motherboard with eight slots (two of them VESA local-bus slots) driven by Intel's clock-doubled i486DX2 CPU with an internal processing speed of 66 MHz. (That puts it a step above the twenty-four 486DX2-50 systems *PC World* reviewed in October 1992, though many of those machines can accept the newer CPU.) On board are 256K of instruction cache memory, 16MB of RAM, an IDE controller, a floppy drive controller supporting 2.88MB drives, and one parallel and two serial ports. An ATI Graphics Ultra Pro (an updated version of the Best Buy featured in our March 1992 video accelerator review) graced one local bus slot. And the IDE controller was hooked to a top-performing Quantum LP240A hard drive.

By Thom Foulks



Foulks's Favorite: Lotus Organizer helps you keep your life in order.

A Resounding Yes

The Micronics system board manual is sparse but well-written. It took me only a few moments to learn what I needed to turn off the board's serial ports so they wouldn't conflict with my cards—BIOS switches from the setup menu. While I waited, cleaning up the shipping box materials from the floor of my office, *LANtastic* was moving much of my standard software from the Cheetah to the MIS 486. (For the record, *LANtastic* moved 1120 files—28.1MB—between the two 486s in 5 minutes, 10 seconds.)

Ready to work, I brought up *Windows 3.1*. It was the allure of running *Windows* at 1280 by 1024—coupled with the CPU power to overcome *Windows'* slowness on lesser platforms—that had sparked my interest in the machine in the first place. My big question remained: Would I feel the difference?

The answer is a resounding yes. As I type this in *Word for Windows 2.0*, at 200 percent zoom with a DOS window open alongside, I finally have enough power to match the promise of so many newer software products. The key hardware component here is the ATI controller, in the VESA local-bus slot. The Video Electronics Standards Association specification for local bus provides the controller a 32-bit, motherboard-speed data path to the CPU. Clearly, the local bus (or Intel's competing PCI standard) will soon be a fixture of new motherboard designs.

Though for my own basic writing and telecommunications needs, the MIS 486 is power-wasting overkill, a CAD architect on a LAN might find it just the tool for an easier, speedier work day. MIS delivers lifetime toll-free support via telephone and offers a number of other support options.

Compaq ProLinea 4/50

Nearby on the power spectrum, but considerably lower in price, the Compaq ProLinea 4/50 is a machine closer to my needs. The Compaq left me no setup to ponder. I just lifted its 14-inch 1024 by 768 monitor, small-footprint CPU unit, keyboard, and mouse from

the box, plugged them in, and flipped the power switch. After I followed some menu-driven setup instructions, the familiar *Windows 3.1* logo popped up on the screen. Almost too easy. I felt I'd been deprived of a challenge (honest, Compaq, I'm only kidding).

I also needed to link the ProLinea to my LAN, so I found my special Compaq screwdriver and opened up the box. Big surprise. I had expected (and had been prepared to tolerate) some lessening of the traditional Compaq hardware quality. After all, at $2800, this machine—with 6MB of RAM, two floppy drives (1.2MB and 1.44MB), plus monitor—is a deal. Compaq has to have cut costs somewhere. If those cuts were in hardware, though, it's not evident. The interior layout of components, even to cable routing, bespeaks forethought and follow-through.

A 486 motherboard of only 8 by 9.5 inches with a three-slot expansion bus mounted vertically shows Compaq's experience at shrinking circuit boards into silicon. A Tseng Labs video chip is on board, along with ports for the keyboard, mouse, two serial devices, and one parallel printer. At its heart is a clock-doubled i486DX2, operating at 50 MHz. This machine could find work on my desktop any day.

Lotus Organizer 1.0

There's only one notable fault I can find with *Lotus Organizer*—you can't choose your own on-screen display font. I will hope for that capability in a later version (Lotus says it is "under consideration") because I've converted my 3000-plus name and address list to *Organizer*, and there it will stay.

Organizer is a PIM—personal information manager. The key word here is personal. Can it be customized to your needs? For example, I need help keeping track of many hundreds of people with whom I've made contact, not only this year, but last year and the year before. I want to be able to find their names and any notes I filed about them and to dial their phone numbers with minimal effort. I just don't need a trip planner, a daily to-do list, or a multi-entry monthly calendar with pop-up reminders. These are all found in *Organizer*, but I rapidly whacked them out of my implementation.

My version of the PIM lets me flip open the Day-timer-styled phone book on my screen, mouse-click to the "T" pages, click to John Thomas's name, and drag and drop the name on the phone icon. I confirm the call with another key click, and it's on its way. The call gets logged automatically; I'm offered the chance to write a note about the call, and another click drops *Organizer* into an ever-ready icon on my *Windows* screen.

Organizer is the one PIM I've used that doesn't dictate what information I should store or try to anticipate how I will use it. Personal, yes, and for sure a Foulks Favorite (especially in use on the ProLinea).

QMS 860 Print System

Add "input power" to the list of criteria by which to compare laser printers. The QMS 860 not only has it, but the firm has also redefined ESP to mean an "emulation sensing processor" with its own form of extrasensory perception. An Intel RISC chip makes this printer smarter than some of the computers that may use it.

With the 860 hooked to my LAN's print server, I sent print jobs to it from three different machines within seconds of each other. One file was normal DOS text, one file was a graphics-laden PostScript Level 2, and the third was for an HP LaserJet II. All three files printed properly—no fuss, no muss—and at 600-dpi resolution, with rich black tones and crisp gray-scale dots. In its PostScript emulation mode (Level 1 or Level 2), the 860 has the usual 35 built-in Adobe PS-compatible fonts as well as four typefaces from the Helvetica family. If you're not on a LAN, you can still share this 8-page-per-minute printer: Various interface options allow simultaneous input from the parallel port, the serial port, an AppleTalk port, and a Novell NetWare port. Through the parallel port, I printed an 86-page *Windows* document in just over 10 minutes.

The Compaq left me no setup to ponder. I just plugged in its monitor, CPU, keyboard, and mouse and flipped the switch.

Then I switched to the 11-by-17-inch print tray and sent a two-page newsletter layout to it from *WinWord 2.0*. The 860's 12MB of on-board RAM gulped it in and gave me a press-ready printout moments later.

At a list price of $4595, however, the QMS 860 is high on the price curve, especially when compared to the HP LaserJet 4 ($2199), a much cheaper, though less powerful, machine. Look for a good dealer's price on this one.

Quick Fixtures

Products should never be fully judged on their beta versions, but Delrina Technology's *WinFax Pro 3.0* has the best integrated optical character recognition of any such package currently on the market. In several tests with fax-modem-generated fax files, my beta copy with the menu-driven Caere AnyFax OCR module achieved conversion accuracy marks close to 100 percent. Previous versions of *WinFax* were a Foulks Favorite; this might be a repeat.

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Thom Foulks is a freelance programmer and former business computer services consultant living in Colorado Springs, Colorado.

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PC World 2/93

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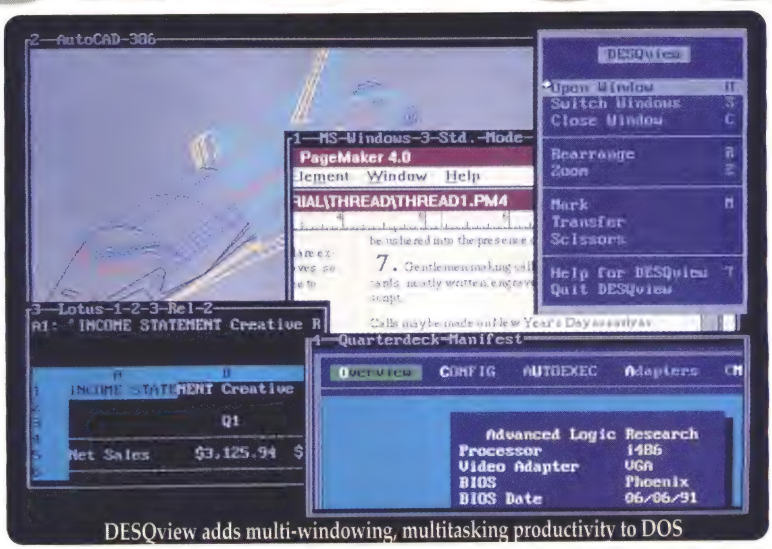

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DESQview 386 gives you pre-emptive multitasking like OS/2, but with 1/20th of the disk space and 1/8th of the memory requirements. It gives you windowing like MS Windows, but with greater speed and efficiency and fewer 'crashes.' And DESQview lets you use a mouse or stick to the keyboard.

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We've never been confused about our role. We believe software companies exist to make your job easier and your working day more productive. When publishers step out of that mold and begin to tell you what hardware you need and that you should throw out somebody else's perfectly good software—well, they simply are not operating in your best interest.

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If you like a program that only runs in MS Windows, like Wordperfect for Windows, DESQview 386 supports your choice. If you prefer a spreadsheet that runs in DOS, Lotus 1-2-3 Release 3, for example, we support that too. In fact, DESQview 386 lets you run your favorite DOS and Windows programs side-by-side.

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DESQview 386 comes with QEMM-386, the number one memory management utility, and Quarterdeck Manifest, the award-winning memory analysis and monitoring program. Between them, they assure you every last 'K' of memory is put to use.* In many cases, QEMM can mean the difference between running the TSRs you want and not having enough memory.

And DESQview is an open doorway to the future, too. Our next step up, DESQview/X, opens your PC to a network full of possibilities, including graphic workstation standards—X Window System software—all while retaining the compatibility of DESQview.

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* DESQview makes multitasking and windowing available to users of 286-class machines with similar memory efficiencies through QEMM-50/60 for IBM™ PS/@ 50 and 60 users and QRAM for other 286 users.

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Circle 189 on reader service card

Follow the Leader: Tribal Chief or Indiana Jones

Civilization, an immensely complicated (and hopelessly habit-forming) game from MicroProse, provides great on-the-job training for being God. Even if you're not interested in that particular job, this fascinating simulation delivers superb mental exercise for the kind of high-powered executive who masterminds two hostile takeovers before breakfast. In fact, the empire-building skills needed to win *Civilization*—long-term planning and acute attention to detail—bear an eerie similarity to those of a good manager.

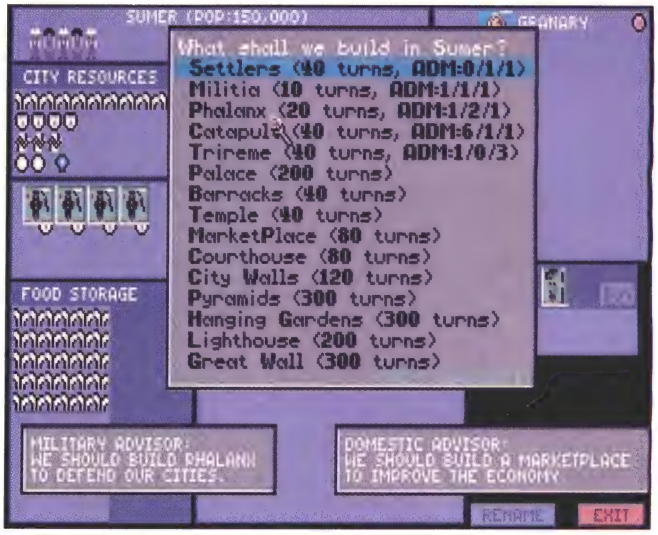
You begin as a tribal chieftain in the dim mists of the primeval past, founding a city and trying to make it grow. You must find a site with good resources and trade options, decide what to produce and how to sell it, and set priorities among defense, economic growth, and your people's contentment. If that isn't complex enough, you'll need to start a religion, choose the most effective form of government, create an irrigation system for your fields, and scout the countryside for trading partners and dangerous enemies.

Moreover, you're in a race with several other tribes to reach the stars. If that sounds far-fetched, keep listening. The time line of this game may start in the distant past, but if you can manage to avoid a barbarian takeover or a Communist revolution along the way, you can pilot your city-state into the modern industrial era—and beyond.

If you make thoughtful choices, inventions and technical breakthoughs will get you from pottery, writing, and iron-working all the way to spaceships and the colonization of Alpha Centauri. Though advisers are present to help you, you'll need to read not one but *two* long, detailed manuals in order to stand a chance of winning—or even outlasting—the barbarians.

By Michael Goodwin

The playing interface takes practice. While the basic metaphor—a map—is simple enough, your cities and their armies, diplomats, and explorers are represented by a bewildering variety of icons. Sometimes the icons blink; sometimes they move by themselves; sometimes they refuse to move. Once in a while they disappear just when you need them (often leaving behind a newspaper headline announcing, for example, that food riots at home have made it economically unfeasible to support military units).



The manuals are long on theory ("a cathedral is very useful for keeping a large city out of civil disorder"), but surprisingly short on practice. They badly need a section that lists all the different icons and how to use them. Figuring out the right combination of mouse and keyboard actions to put your newly built warship in the water, for instance, can take far too much trial and error.

Given the intricacy of the game, though, it's not surprising that it takes a while to learn. There are already books you can buy to help you play better (such as *Civilization*, or *Rome on 640K a Day*). And be warned: This is probably not a good game to get into if you have other goals in life—like eating, working, or sleeping.

Why Should I, You Fat Tub of Lard?

If *Civilization* springs from an academic/historical tradition, there's no secret about the origin of *Indiana Jones and the Fate of Atlantis*. LucasArts Games' delightful comedy-adventure is the most purely cinematic computer game I've ever played.

The story and "screenplay"—both written by ace screenwriter/filmmaker Hal Barwood, who co-wrote *Sugarland Express*, Steven Spielberg's first film—are loaded with snappy dialog. For instance, when Indy runs across a big bully who won't let him into a theater, you can choose between a gracious apology and a highly provocative insult. The wiseguy put-down is so irresistible, you may not notice that sweet-talking your way past the bruiser (or simply knocking him out) is a lot more effective. Even if cracking wise slows your progress down a bit, it makes the adventure a lot more entertaining.

SETTING PRIORITIES is the biggest trick in Civilization. It might be nice to have a pyramid, but building it takes a lot longer than constructing a catapult.

You can choose actions as well as dialog with a swift click of the mouse. And in between brawls and travel to distant places you'll find yourself watching a series of exciting, tightly scripted set-pieces; they're short films really, that turn your PC screen into a private theater, providing essential information and advancing the plot.

That plot isn't very weighty, of course. Set during World War II, it involves the usual collection of Nazi

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spies, feisty sidekicks, exotic locales, and eccentric vehicles. But like the films that inspired it, the point of *Indiana Jones and the Fate of Atlantis* isn't high drama—it's low entertainment. And does it deliver!

One of the nicest touches in this game is that it's actually three games in one. Many role-playing adventures offer only one line through the tale. If you go back for another run, it's déjà vu city. *Indy Jones* provides a neat solution. Early in the story, just after you've gotten your bearings (and met your feisty sidekick), you're presented with a choice of three tracks: Play the rest of the game as a team; go it alone, using your brains to solve problems; or push toward victory as a solo act, using brute fisticuffs. Some sequences occur on all three paths; others don't. No matter which path you choose, saving the game just before you make the decision lets you play out the alternative tracks another time, after you've finished your chosen version.

But whether you proceed as a single or a double, by brains or by brawn, don't start this game on your lunch break—unless you're prepared to take the afternoon off.

Civilization $69.95; MicroProse Software Inc.; 800/879-7529

Reader service no. 720

Indiana Jones and the Fate of Atlantis $59.95; LucasArts Games; 800/782-7927

Reader service no. 721

Michael Goodwin is a contributing editor for PC World. *He can be reached on PC World Online (see page 8 for more information).*

POWER TIP no. 272

Making Cents in WordPerfect

WordPerfect 5.1 **includes some very helpful and easy-to-use character keys. For instance, for the fraction ½ or ¼, press <Ctrl>-V and type in /2 or /4, respectively. For the cent sign, use <Ctrl>-V and /c (the c must be lowercase). For the trademark and registered trademark symbols, press <Ctrl>-V and type TM and ro (uppercase or lowercase, respectively).**

In *WordPerfect for Windows*, use <Ctrl>-W instead of <Ctrl>-V.

Judy Heim
Contributing Editor

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Confessions of a Gadget Junkie

Okay, I admit it. I like gadgets. There's nothing better than a cheap gizmo that solves one problem, no matter how small. Here are some of my favorite little pieces of hardware:

Have you ever picked up the phone while you're in the middle of downloading an enormous file, breaking the connection and forcing yourself to start over? I hate it when that happens. It's Busy is a neat little gadget by Pacific Ideas that sits beside the phone and flashes a red light whenever the line is in use, warning you not to pick up the phone. It's essential if there's more than one phone sharing the line with your modem. • *It's Busy $12.99, Pacific Ideas; 619/530-2879, 619/530-2878 (fax). Reader service no. 710*

One of these days, I'll invest in a second line so that my fax-modem and phone don't have to share. But for now, I use a Command Communication's ASAP TF 333 line manager to sort out the barrage of incoming calls. For a street price of about $120, the ASAP TF 333 is smart enough to distinguish between a fax and voice call. If I'm not able to answer the phone, it will even direct the call to my answering machine. You'll need to step up to the $179.95 ASAP TF 555 if you have a separate fax machine and modem. • *ASAP TF 333 $139.99, Command Communications; 800/288-6794; 303/751-7000. Reader service no. 711*

Prevent Global Warming

Most people are surprised when they discover the heat a 486 chip produces—in fact, touching the CPU can actually burn your finger. Add-in boards, like fax-modems or memory expansion cards, and extra RAM all add to the heat inside the case. And hardware's two worst enemies are—you guessed it—heat and power surges.

That's why I installed a FanCard, a slim expansion board that has two thin fans inside. The burden on the power supply is minimal—less than five watts—and installation is easy. For about $50, the next time you turn the computer on, the fans will cool things down to a suitable temperature, extending the life of your system. • *FanCard $99.95, T.S. MicroTech, Inc.; 310/787-1640. Reader service no. 712*

I have trouble keeping my desktop lamp's glare off the monitor. The solution? LightMan, a slick computer keyboard light that slides under my monitor and shines on both my keyboard and the surrounding desk area. The LightMan uses a 40-watt incandescent bulb so there's no fluorescent flickering. • *LightMan $39.95, Micro Pulse Electric; 914/628-4038, 914/628-5365 (fax). Reader service no. 713*

A Kit for All Seasons

In the past, every time I had to pull a chip or change cables, I had to spend ten minutes looking for the right tools. But with a Curtis Tool Kit, I have all the small screwdrivers, chip pullers, needle-nose pliers and pin straighteners I'll ever need, demagnetized and neatly organized in a vinyl case. The 11-piece set can be found discounted at about $20. But if you've ever dropped a screw into the case—something *I* never do—get the larger set. For a discounted $50, it includes—among other tools—a handy device for retrieving lost screws. • *Curtis Computer Tool Kit $29.95-$79.95, Curtis Manufacturing; 800/955-5544, 603/532-4123 (fax). Reader service no. 714*

On occasion I eat lunch at my desk, so I protect my keyboard from spilled coffee, sandwich crumbs, and other vestiges of my meals with SafeSkin, a

form-fitting, plastic cover. While I'm aware of its presence, it doesn't slow down my typing and I can still feel the reassuring snap of the keys. SafeSkin is available for more than 1000 keyboard models so it's very likely you can find one that fits yours. • *SafeSkin $29.95, Merritt Computer Products, Inc.; 214/339-0753, 214/339-1313 (fax). Reader service no. 715*

I sometimes finish working late at night and don't want to stay awake staring at the monitor while the computer backs up and optimizes my hard disk. To turn off the computer at a specified time, I use the Intelligent Power Module, a $59 gadget that sits between the power outlet and the computer (or power strip). Via special software and a bundled cable, Power Module lets you set up your computer to turn itself off. • *Intelligent Power Module $59, Server Technology, Inc.; 800/835-1515, 408/988-0142. Reader service no. 716*

All this just goes to show you, software solutions aren't always the best solutions. Sometimes, a gadget really is worth a thousand lines of code.

Contributing Editor Steve Bass is the president of Pasadena IBM Users Group. He can be reached on PC World Online (see page 8 for more information).

by Steve Bass

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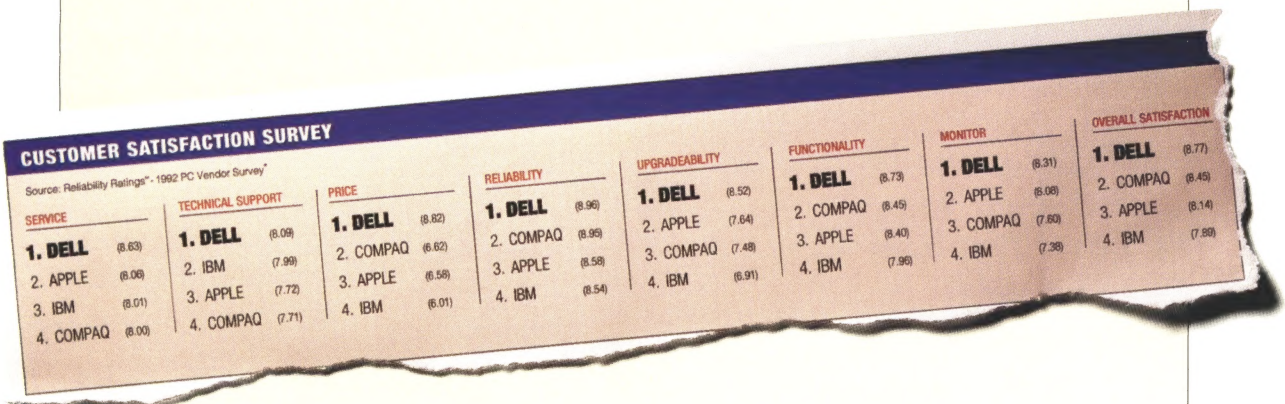

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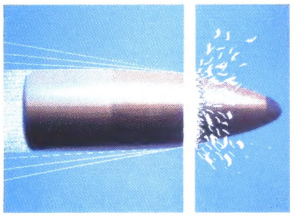

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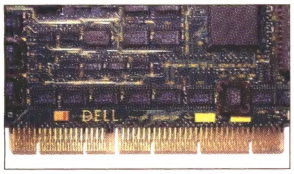

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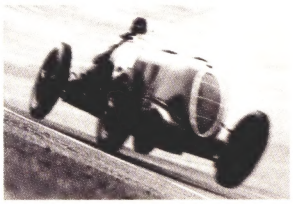

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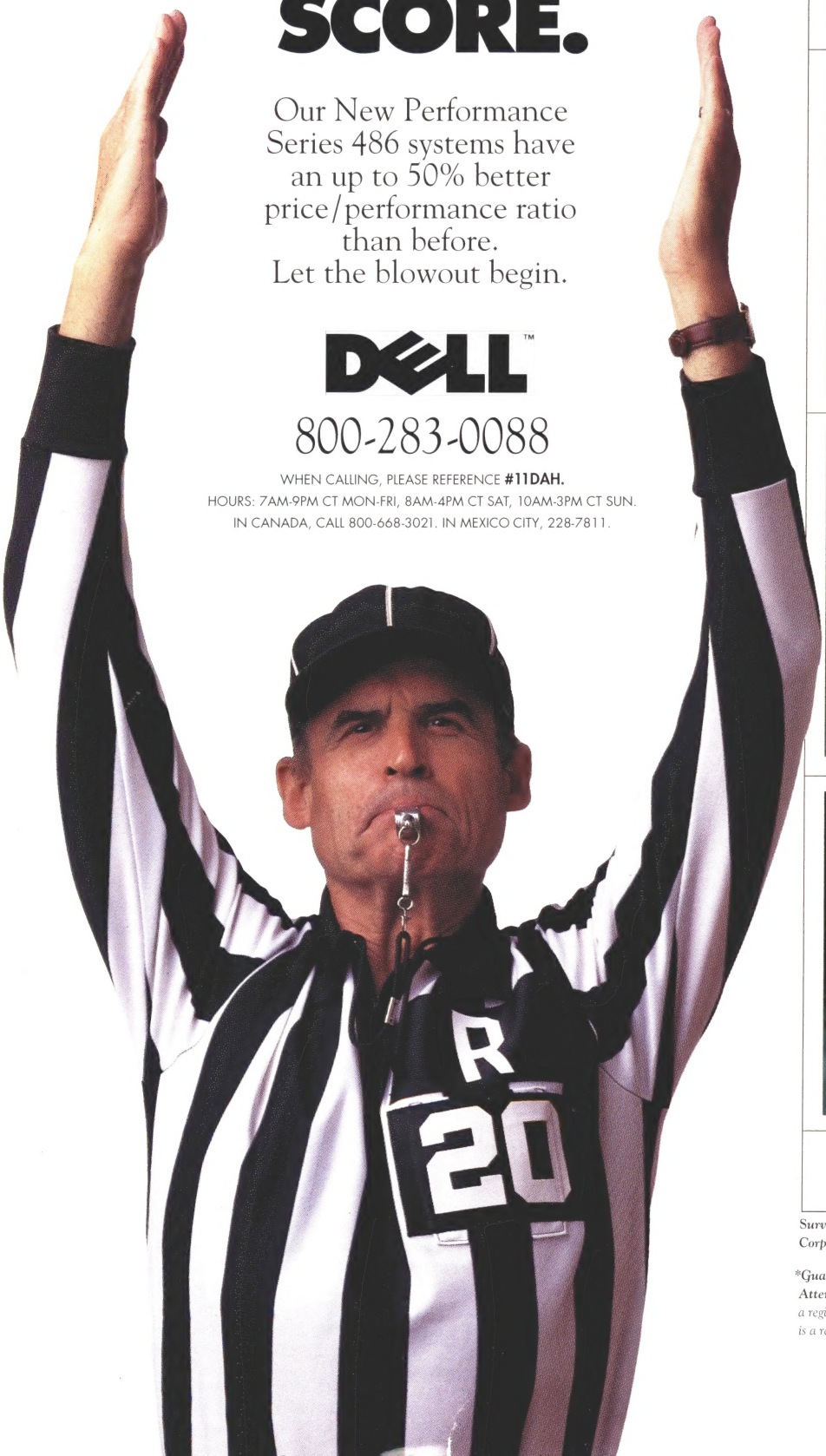

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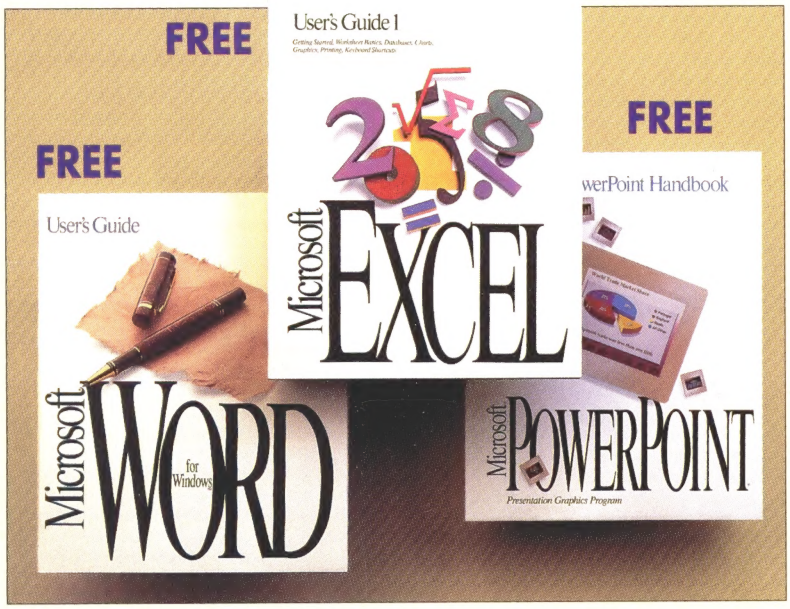

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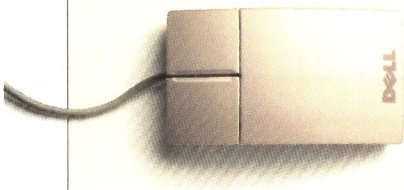

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